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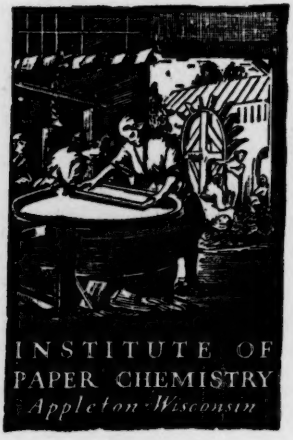
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH
LAWRENCE COLLEGE
APPLETON, WISCONSIN

LIBRARY NOTES

SEPTEMBER · 1950
Volume 21 Number 1

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THE INSTITUTE OF PAPER CHEMISTRY

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Books and Pamphlets Added to the Library During August

COLORIMETRY

JUDD, DEANE B. Colorimetry. U. S. National Bureau of Standards circular 478. Washington, U. S. Govt. Print. Off., 1950. 56 p.

ENGINEERING INSTRUMENTS

ECKMAN, DONALD P. Industrial instrumentation. New York, Wiley [c1950] 396 p.

ETHICS

ADLER, FELIX. Our part in this world; interpretations. New York, King's Crown Press, 1946. 93 p.

HEAT—TRANSMISSION

KERN, DONALD Q. Process heat transfer. New York, McGraw-Hill Book Co., 1950. 871 p.

LIGNITE

SELVIG, A. A., ODE, W. H., PARKS, B. C., and O'DONNELL, H. J. American lignites: geological occurrence, petrographic composition, and extractable waxes. U. S. Bureau of Mines. Bulletin 482. Washington, U. S. Government Printing Office, 1950. 63 p.

MINES AND MINERAL RESOURCES

[U. S. BUREAU OF MINES] Minerals yearbook, 1948. Prepared under the direction of E. W. Pehrson; Allan F. Mathews, editor. [Washington, U. S. Govt. Print. Off., 1950] 1652 p.

PAPER MAKING AND TRADE

JOINT EXECUTIVE COMMITTEE ON VOCATIONAL EDUCATION REPRESENTING THE PULP AND PAPER INDUSTRY OF THE UNITED STATES AND CANADA. Pulp and paper manufacture. v. 1. Preparation & treatment of wood pulp. J. Newell Stephenson, editor-in-chief. New York, McGraw-Hill Book Co., 1950. 1043 p.

PAPER MAKING AND TRADE—RAW MATERIALS

HERZBERG, WILHELM. Die Schäfferschen Papierversuche. [Originally published 1898, reprint] Hagen-Kabel, Papierfabrik Kabel A.G., 1949. 62 p.

RHEOLOGY

REINER, MARKUS. Deformation and flow; an elementary introduction to theoretical rheology. London, H. K. Lewis & Co., Ltd., 1949. 346 p.

STATIONERY TRADE

KÜBLER, E., und elf Mitarbeiter. Warenkunde des Papeteristen. [Zürich] Verband Schweizerischer Papeterien [c1949] 264 p.

TRADE DIRECTORIES

POST'S Paper mill directory, 1950 ed. J. J. O'Brien, editor. New York, L. D. Post, Inc., 1950. 656 p.

TREES

HARLOW, WILLIAM M., and HARRAR, ELLWOOD S. Textbook of dendrology, covering the important forest trees of the United States and Canada. 3d ed. New York, McGraw-Hill Book Co., 1950. 555 p.

WATER-MARKS

HEAWOOD, EDWARD. Watermarks, mainly of the 17th and 18th centuries. Monumenta chartae papyraceae historiam illustrantia, or collection of works and documents illustrating the history of paper. I. General editor: E. J. Labarre. Hilversum (Holland), The Paper Publications Society, 1950. 154 p. + 533 plates.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADHESIVES

CALDWELL, C. G. Industrial adhesives. Chem. Inds. 67, no. 2: 218, 220, 222 (August, 1950).

A review is given of new techniques, new machines, and new uses for hot melts, emulsions, thermosetting adhesives, vegetable and animal glues, and new adhesive materials for industrial uses. J.A.B.

BAMBOO

GRAY, F. W. Bamboo for pulp and paper. Indian Print & Paper 15, no. 62: 40-1; no. 63: 42-3 (January, April, 1950).

The author describes his travels in search of bamboo in India and Burma in 1921. Although ample bamboo supplies were found in both places, Indian conditions for the establishment of a pulp and paper mill were far more attractive. An ideal site was located at Naihati, about 25 miles above the port of Calcutta, where fresh water is available. Although this involved the transportation of the crushed and baled bamboo from the forest reserves in the Chittagong Hill tracts, a bamboo pulp and paper mill was constructed in this location with a daily capacity of 10 tons of first-quality paper. E.S.

BANANA FIBER

CHITTENDEN, A. E., and COOMBER, H. E. Banana fibre from Jamaica; suitability as a paper-making material. Bull. Imp. Inst. 46, nos. 2-4: 218-23 (1948).

The results of chemical analyses and microscopic examinations of two varieties of banana fiber are given. Papermaking trials by the soda process, the evaluation of the resulting pulps, bleaching trials, and the effect of beating on these pulps are also described. The studies showed that only moderate yields of soda pulp under reasonable cooking conditions can be obtained; the pulps could be bleached economically but with a fairly high bleaching loss. They have certain undesirable features, such as the difficulty with which they can be disintegrated and a very long drainage time. The wetness could be improved by proper cleaning of the fiber prior to pulping. The results obtained on a laboratory scale were confirmed by commercial evaluations. The pulps seem only suitable for certain specialized purposes; however, the cost of production greatly exceeds the figure at which the use of the material would be economically feasible. 4 tables. E.S.

CHITTENDEN, A. E., and COOMBER, H. E. The suitability of banana trash from Jamaica as a paper-making material. Colonial Plant and Animal Prod. [succeeding Bull. Imp. Inst.] 1, no. 1: 64-7 (1950); Paper-Maker (London) 120, no. 3: 163-5 (September, 1950).

Studies at the Imperial Institute with samples of banana trash from Jamaica obtained from the leaves of the banana plant showed that it will

furnish pulps of moderate strength and elasticity under fairly mild cooking conditions; however, the soda consumption is very high. All the pulps showed poor drainage properties and contained large amounts of shive; parenchymatous tissue present in the original material probably accounts to a large extent for the wetness of the pulp. It was not possible to produce a fully bleached pulp with economic quantities of standard bleach. Beating increased the tensile strength of the pulp, and prolonged the drainage time very considerably. The general conclusion is that trash similar to the material investigated produces paper of generally poor quality and appearance. In view of the high chemical consumption, it is unlikely that it could be pulped economically by the soda process. 5 tables. E.S.

BLEACHING

ANON. Salesmen tour Wausau's new sulphite bleach plant. Paper Ind. 32, no. 5: 486-9 (August, 1950).

An illustrated description of the three-stage continuous sulfite bleaching process at the Wausau Paper Mills Co., Brokaw, Wis., is given. The six-story plant is designed to handle up to 125 tons of stock over a 24-hour period; the treatment involves low-density chlorination, high-density caustic extraction, and high-density hypochlorite bleaching. 10 illustrations and 1 flowsheet. E.S.

BLEACHING—GROUNDWOOD

ANON. A new bleaching process successfully used in Canadian mill. Pulp & Paper 24, no. 9: 70, 72 (August, 1950).

A brief illustrated description of the groundwood-mill installations of the Westminster Paper Co. Ltd. in New Westminster, B.C. is given, with particular reference to the BECCO cold-steep bleaching system (*cf.* B.I.P.C. 20: 917). The hydrogen peroxide solution which is rendered active by alkaline sodium silicate is applied by a drip shower to two applicator rolls between which the Kamyr-pressed pulp lap passes; nylon brushes assist in spreading the liquor evenly over the roll surfaces. The impregnated rolls are allowed to stand for one to five days, whereupon the pulp is added to the furnish. Nearly 90% cottonwood is used for this purpose, because it is of a naturally bright color and very responsive to the bleaching treatment. The bleached groundwood is used exclusively as a filler in the manufacture of sanitary papers (toilet, napkin, and toweling) for which unbleached groundwood has been found unsuitable. It is not used in the manufacture of the company's extensive lines of waxed papers. All equipment in contact with either stock or white water is either Transite or plastic coated. 2 illustrations and 1 diagram. E.S.

ANON. Peroxides war on waste. Du Pont Mag. 44, no. 4: 12-13 (August-September, 1950).

A brief history is given of the peroxide bleaching process for groundwood, which is said to have saved $2,500,000 worth of wood in the last year. 5 illustrations. J.A.B.

BLEACHING—SULFATE

CHADEYRON, L. The bleaching of maritime pine pulp. Papeterie 72, no. 7: 357, 359, 361, 363, 365, 367, 369 (July, 1950). [In French]

Following a brief reference to bleached sulfite pulp made from maritime pine (I) in the Tartas mill in Southern France, the author outlines the history of bleaching kraft pulp obtained from (I). When bleached at a low

consistency (3%), kraft pulp made in France showed approximately the same brightness, fastness to light, and α-cellulose as that of Scandinavian origin, but the strength of the French product was distinctly inferior. When French kraft was bleached in four steps at 30% consistency, a marked improvement was noted in breaking length, folding endurance, and tear, with a slight improvement in bursting strength. Bleaching involved chlorination, alkaline digestion, and two alkaline hypochlorite treatments. However, the quality of the French bleached kraft was still well below that of the best grade of Swedish bleached sulfate. An excellent, but difficultly bleachable Swedish sulfate, when bleached in the laboratory to a brightness of 87% in six steps, the final one of which involved a flash bleach with chlorite (from acidified sodium chlorite), gave a product of very high folding endurance and other quite high strength properties. Comparative data are given, and schematic sketches show the bleaching operations. 5 tables and 5 diagrams. L.E.W.

BOARD

CARR, L. J. Hardboard marketing problems. Wood 5, no. 8: 18, 39 (August, 1950).

In a discussion of the effective marketing of "wood particle board" (covering the entire field of wallboard or industrial board from wood fiber), the author points out the necessity for a uniform set of testing standards, effective advertising, proper pricing, and close co-operation among manufacturers. J.A.B.

BOARD—STATISTICS

NEWBURG, ALVIN A., and BETTENDORF, HARRY J. Paperboard [mill] industry statistics. Fibre Containers 35, no. 8: 133-44 (August, 1950); *cf.* B.I.P.C. 20: 71.

The highest production of paperboard in any year occurred during 1948, when 9,510,800 tons were made; the production in 1949 amounted to 9,069,600 tons, which was the third highest yearly output. The first half of the year was at a relatively low level and totalled 4,301,300 tons, whereas the second half was 11% higher, and the tonnage amounted to 4,768,300 tons. Since the war period, the largest increase in the containerboard capacity has been in the Fourdrinier kraft board division, and some mills installing these machines have closed down their obsolete cylinder machines. The result has been an increase in Fourdrinier kraft liner and a decrease in cylinder jute liner. Another significant change is the decrease in chip and filler boards used in the manufacture of solid fiber boxes. The boxboard grades have been increasing in recent years in volume, notably the setup grades, which have increased about 40% since 1946, while the balance of the industry as a whole has increased around 7%. Tabulated statistical data, diagrams, and pie charts are included in the article. E.S.

BOARD MILLS—WASTE LIQUOR

GEHM, HARRY W., and BEHN, VAUGHN C. High-rate anaerobic digestion of industrial wastes. Sewage Ind. Wastes 22, no. 8: 1034-40 (August, 1950); *cf.* B.I.P.C. 19: 6.

An appraisal of the present status of the high-rate anaerobic digestion process is presented. Ten wastes for which recent, reliable experimental data exist (strawboard, chipboard, fiberboard, semichemical pulping, wool scouring, compressed yeast, natural gum, milk, distillery, and penicillin) were selected, and performance figures on loading and detention periods, strength of wastes, gas production, necessary nutrients, and mechanical requirements are given. It appears from this discussion that both process- and equipmentwise a limit of efficiency has been reached; the limiting factor is that at excessive

loadings volatile acids accumulate and gas production fails to keep step. On continued overload, volatile acid formation is also inhibited. Unless higher levels of efficiency can be obtained, the process will have quite limited application. Further progress must come from additional laboratory studies. 2 tables and 14 references. E.S.

BOARD SPECIALTIES

YOWELL, L. Q. Corrugated pallet produces savings in shipping costs. Am. Paper Merchant 47, no. 8: 16-17, 33 (August, 1950).

The Power Pack, an expendable corrugated board pallet recently perfected by Addison-Semmes Corp., Racine, Wis., consists of double-face or double-wall corrugated decks securely glued to convolutely wound, single-faced corrugated posts. The posts range from four to 16 in number and from five to seven inches in diameter. The pallet may be used with either adhesive or metal strapping. Savings in cost over wooden skids or pallets are the result of lower freight rates, no return shipping charges, no maintenance costs, lower production costs, and increased tax exemption. Other advantages of the corrugated pallet are listed. 8 illustrations. J.A.B.

BOARD TESTING—PHYSICAL

BLUMENSTEIN, ROBERT R. How to evaluate hardboard. Wood 5, no. 8: 27-9, 38-9 (August, 1950).

In the systematic evaluation of hardboards, tests are made to determine strength, tension, ability to hold nails and screws, water absorption, linear expansion, resistance to aging, and other properties. A brief description is given of each test. The papermaking, wet-mix, and dry-mix techniques of manufacturing hardboards are also described. 3 illustrations. J.A.B.

BOOKBINDING

MINER, PEG. Revolution in bookbinding. Du Pont Mag. 44, no. 4: 2-4 (August-September, 1950).

A brief outline is given of the development of hot-melt adhesives, which have the permanence and flexibility necessary in bookbinding and are unaffected by changes in climate. 7 illustrations. J.A.B.

CASTOR OIL PLANT

CHITTENDEN, A. E., and COOMBER, H. E. Castor stems from Ceylon. Bull. Imp. Inst. 46, no. 2-4: 223-7 (1948); *cf.* B.I.P.C. 10: 469.

The present preliminary investigation showed that the sample of castor stems from Ceylon is reduced to paper pulp by the soda process under fairly mild cooking conditions, but the amount of soda consumed during the digestion is high. Papers prepared from the unbeaten pulps lack strength and this would restrict their use. The pulps are also difficult to bleach. Bleaching and beating improved some of the pulp characteristics, chiefly the breaking length, but caused considerable deterioration in tearing strength and drainage time. The results of the examination show that a weak, rattly paper with a short tear can be produced from castor stems. The pulps would therefore only be suitable as a filler for longer-fibered pulps. In addition, the high consumption of soda and bleaching materials would be serious drawbacks from the economic standpoint. The pulps might be improved somewhat if the pith could be removed from the stems before treatment, but it is unlikely

that the results obtained would balance the additional cost involved. 6 tables. E.S.

CAUSTICIZING AND RE-CAUSTICIZING

INFILCO, INCORPORATED. Accelerated chemical causticizing. Pulp and Paper Manual of Canada 17: 47, 49, 51, 55 (1949).

The addition of a magnesium salt, preferably magnesium sulfate, to both green and white liquors results in the almost instantaneous formation of the insoluble magnesium hydrate; the coagulating effect of the latter accelerates the clarification processes and improves the physical and chemical properties of both muds and liquors. Details of the procedures involved are given. The amount of coagulant is readily adjustable, so that the entire process may be controlled to meet varying conditions. Filtration may be employed economically to remove the last traces of suspended matter. The process permits the use of smaller settling tanks without internal moving mechanisms, where each step takes place within a separate tank. Centrifuges may be used for dewatering the final mud, as well as for separating the cooking liquor from the strong mud. The unit functions of the process may be incorporated into existing equipment. 13 figures. E.S.

CELLOPHANE

BURKE, GENE. Birth of a package. Du Pont Mag. 44, no. 4: 10-11 (August-September, 1950).

Brief mention is made of the role played by the converter in printing the cellophane film MSAT 87, for use on frozen food packages. 7 illustrations. J.A.B.

CELLULOSE—SORPTION

KLEINERT, T., and SIEBER, F. Determination of the bromine absorption power of cellulose. Österr. Chem.-Ztg. 50: 91-3 (1949); C.A. 44, no. 1: 325 (Jan. 10, 1950). [In German; abstract in English. Abstract only available]

Cellulose was hydrolyzed in a mixture of concentrated phosphoric and hydrochloric acids, and the acid hydrolyzate was brominated with 0.1 *N* potassium bromate-bromide solution. For unbleached cellulose the bromine absorption value is 0.4 to 0.7% and parallels the permanganate-chlorine number. E.S.

CELLULOSE ESTERS

MALM, C. J., MENCH, J. W., WILLIAMS, R. F., JR., and HIATT, G. D. Pyridinium salts of cellulose acetate-chloroacetate. Ind. Eng. Chem. 42, no. 8: 1547-50 (August, 1950).

The preparation of cellulose acetate-chloroacetates by a variety of procedures is described, and properties and methods of analysis are given. The reaction of these products with tertiary amines, such as pyridine, goes substantially to completion and yields quaternary ammonium salts. A large number of these are water soluble but hydrolyze readily in aqueous solution to regenerate cellulose acetate and liberate *N*-carboxymethylpyridinium chloride. The pyridinium salt of a cellulose acetate-β-chloropropionate is also described. This is more stable to hydrolysis than the α-betaine compounds. 3 tables, 1 figure, and 25 references. E.S.

CELLULOSE ESTERS—NITROCELLULOSE

CAMPBELL, H., and JOHNSON, P. Aging of solutions of cellulose nitrate. J. Polymer Sci. 5, no. 4: 443-63 (August, 1950).

The aging of cellulose nitrate solutions in acetone and other solvents has been followed by viscosity measurements. The plots of viscosity *vs.* time, in general, are characterized by an initial rapid decrease in viscosity followed by a slow, continuous decrease. Ultramicroscopic aggregates were not observed, and structural viscosity was absent. The initial rapid aging was small in cellulose nitrates of high nitrogen content (few hydroxyl groups), and in those which had been recovered from solution or treated with a small proportion of water in solution. Slow aging was observed in all cellulose nitrates examined. This aging process was accelerated by a rise in temperature and appeared to be sensitive to catalytic impurities. It is suggested that the rapid aging process is caused by the breakdown of interchain linkages, probably of the H-bond type. The slow aging probably represents the breakdown of the main-chain glucoside linkages. 4 tables, 10 figures, and 26 references. J.O.T.

CELLULOSE ETHERS

LESSER, MILTON A. Cellulose derivatives in soap. Soap Sanit. Chemicals 26, no. 8: 29-32, 82 (August, 1950).

The author reviews the use of methylcellulose and sodium carboxymethylcellulose in soaps as fillers and for imparting softness and increasing detergency. 34 references. E.S.

CHEMICAL TESTING—PULP

SCHUR, MILTON O., and LEWIS, HARRY F. The role of pulp viscosity and the degree of polymerization in papermaking. Tappi 33, no. 8: 392-7 (August, 1950); Pulp Paper Mag. Can. 51, no. 9: 92-7, 212 (August, 1950).

The average D.P. of a pulp (related to the average molecular weight of the carbohydrate fraction) may be determined by a number of methods. Of these, the viscosity of a pulp solution in cuprammonium or cupriethylenediamine is most commonly used. The viscosity determination is of value in the control of loss of pulp quality during processing or as a specification in the manufacture or purchase of a pulp for a definite use. The standard methods currently approved are time-consuming and rather tedious. Quick methods are needed for control, and the cupriethylenediamine method of Straus and Levy seems to fit the requirement. Some modification of this should be worked out and accepted as a standard method. Fractional solution methods for determining the chain-length distribution in a nitrated pulp are inadequate and misleading. Fractional precipitation of a nitrated pulp from acetone solution by water has been refined to the point of real utility. Further studies of the type of Tasman and Corey (*cf.* B.I.P.C. 17: 479) and of Jørgensen (doctoral dissertation) should provide significant information. 1 table, 2 figures, and 17 references. E.S.

CHEMICALS

ANON. Paper is better now. Du Pont Mag. 44, no. 4: 18-19 (August-September, 1950).

Many of the recent improvements in paper products are attributed to better chemicals, such as colored dyes, industrial aromatics, and water repellents. 7 illustrations. J.A.B.

KINGERLEY, R. W. Some chemical developments for the paper industry. Paper Trade J. 131, no. 5: 19-20, 22, 24 (Aug. 3, 1950).

A cross section is given of the 600 or more chemicals that have been developed to aid paper processing and to improve pulp and paper quality, as

well as to impart specific characteristics required by the papermaker. 13 references. J.A.B.

YOUNGCHILD, K. E. Pulp and paper chemicals. Chem. Inds. 67, no. 2: 217-18 (August, 1950); *cf.* B.I.P.C. 20: 239.

As a consumer of chemicals, the paper industry ranks third in the U. S., and the demand is steadily increasing. The applications of chemicals in pulping and bleaching, sizing, and coating are discussed, as well as heavy chemicals, synthetic resins, and specialties. Trends in this field in 1949 are pointed out, and several new chemicals are mentioned. J.A.B.

CHLORINE DIOXIDE

MACLEOD, K. S. Bleaching pulp with chlorine dioxide. Can. Pulp Paper Ind. 3, no. 8: 62, 64, 66, 68, 70 (August, 1950); *cf.* B.I.P.C. 20: 549.

Following a brief discussion of the use of chlorine dioxide in water treatment and the bleaching of flour, textiles, fats and oils, and rag, flax, sulfite, and kraft pulps, the most common bleaching methods employed in the production of paper pulp (acid and hypochlorite activation of sodium chlorite and the reaction of chlorine with sodium chlorite) and their application to kraft and sulfite pulps are described. Although not limited to batch operations, the acid and hypochlorite activation methods are most suitable for batch-bleaching processes and are used in specialized fields, such as the bleaching of rag and flax pulps. The third method may be used in conjunction with either batch or continuous bleaching, but is particularly well adapted to the continuous bleaching processes of the large kraft and sulfite mills. In conclusion, the generation of chlorine dioxide from sodium chlorate is discussed. From an economic standpoint, the prerequisite for the installation of a chlorate generation plant would be a minimum demand of 2000 pounds of chlorine dioxide per day, corresponding to about 250-300 tons of bleached pulp. Although sodium chlorite bleaching is somewhat more expensive than a conventional hypochlorite bleach, the improved pulp qualities justify the slight extra cost. 3 figures and 15 references. E.S.

MACLEOD, KEITH S. Industrial applications of sodium chlorite and chlorine dioxide. Can. Chem. Process Inds. 34, no. 8: 640-2 (August, 1950); *cf.* preceding reference.

The use of chlorine dioxide in water treatment and bleaching of fats and oils, textiles, pulp, and flour is described. 1 table and 1 diagram. E.S.

COLORIMETRY

NICKERSON, DOROTHY, HUNTER, RICHARD S., and POWELL, MARSHALL G. New automatic colorimeter for cotton. J. Optical Soc. Am. 40, no. 7: 446-9 (July, 1950).

A new instrument for measuring the color of cotton is based on a satisfactory application of the Hunter Color and Color-Difference meter to the problems of raw cotton measurement. It is designed to be fully automatic and self-standardizing, and to show graphic values for reflectance (R_d) and yellowness ($+b$) on a two-dimensional chart. It is self-contained in a movable cabinet, with a minimum of exposed parts. Although this particular model is limited to measurements in the range of cotton color, the principles on which it is designed are adaptable to other limited ranges of color, in either two or three dimensions, thus providing an automatic, self-standardiz-

ing, small-difference colorimeter for other limited ranges of color. 5 figures and 9 references. J.A.B.

COMPRESSION WOOD

DADSWELL, H. E., and WARDROP, A. B. What is reaction wood? Australian Forestry 13, no. 1: 22-33 (1949).

The information available in the literature and the laboratory records of the Division of Forest Products of the Commonwealth Scientific and Industrial Research Organization on the compression wood of gymnosperms and the tension wood of angiosperms has been summarized with particular reference to macroscopic appearance, microstructure, chemical composition, and properties. In each case, a comparison with normal wood has been made. The occurrence of both types of reaction wood is discussed, and attention is directed to possible factors involved in their formation in the living tree. 10 figures and 26 references. E.S.

CONTAINER INDUSTRY

BETTENDORF, HARRY J., and HELME, ROY V., JR. Statistical summary of the paperboard group of industries. Fibre Containers 35, no. 8: 64, 66, 71-2, 76, 78, 80, 85-6, 88, 90, 92, 97-100, 102, 104, 109-10, 112, 114 (August, 1950); *cf.* B.I.P.C. 20: 77-8.

The initial summary covers the following sections: paperboard—the mass-production package; growth of the paperboard fields; some unusual comparisons of growth (containers *vs.* phone calls; fiber boxes reaching to the moon); population *vs.* new uses as growth factors; capacity growth; some basic economic facts regarding the field; long- and short-term trends in the field; problems with threat of return of war; summary of fibrous raw material; broad growth of board and containers; and relative growth of board and paper. Numerous statistical tables, pie charts, and diagrams are included. E.S.

CORES

FAUL, T. L. The manufacture of paper cores. Pulp Paper Mag. Can. 51, no. 8: 77-9 (July, 1950).

The author describes the raw materials (board strips and glue) and machinery used in the manufacture of paper cores. Details of the operation of the core machine, circular saw, crimping machine, slotter, core-tip press, and core-tip puller are given, with emphasis on the correct angle at which the paper strips must approach the mandrel and the rate at which the glue is applied. 4 figures. E.S.

DIFFUSION

BABBITT, J. D. On the differential equations of diffusion. Can. J. Research 28 A, no. 4: 449-74 (July, 1950).

The fundamental bases of the differential equation of diffusion are examined. From a dynamic equation defining the motion of the gas, an equation of continuity expressing the law of conservation of mass, and an equation of state giving the relation between concentration and pressure, the differential equations are derived for the interdiffusion of two gases, for the diffusion of vapors, and for the diffusion of gases and vapors through solids. For the diffusion of gases through adsorbing solids, the dynamic equation of the flow is obtained by equating the space derivative of the spreading pressure of the adsorbed film to a resistive force equal to the product of the coefficient of resistance and the velocity of the film. The differential equations derived on this assumption agree qualitatively with measurements for

the diffusion of gases through metals when the adsorption can be represented by Langmuir's equation. When the adsorption follows the Brunauer, Emmett, and Teller equation, qualitative agreement is found with the diffusion of water vapor through hygroscopic materials. It is also shown that Fick's law is not generally valid as the fundamental equation of diffusion. 1 table, 5 figures, and 13 references. J.A.B.

DOCUMENTATION

VICKERY, B. C. Reference aids for the literature search. Some problems of a technical library. Ind. Chemist 26, no. 301: 70-2; no. 304: 220-2 (February, May, 1950).

In the first part of the article, a brief account of the most essential aids to a literature search is given; in the second part, certain problems of library organization are discussed, such as the orderly arrangement of documents, the analytical subject index, and document reproduction. A very useful bibliography with 29 reference headings (under most of which considerably more than one title is given) is appended; many British reference sources are listed. E.S.

DYES AND DYEING

CRANK, J. The diffusion of direct dyes into cellulose. III. The present state of the theory and its practical implications. J. Soc. Dyers Colourists 66, no. 7: 366-74 (July, 1950); *cf.* B.I.P.C. 19: 391-2.

Some recent theoretical papers concerned with the diffusion of direct dyes into cellulose are reviewed. Mathematical solutions of the diffusion equation applicable to dyeing with a restricted amount of dye, as in commercial practice, are presented in a form suitable for calculation. Several examples of calculated rate-of-dyeing curves, suitable for direct comparison with measured rates of dyeing from a commercial dyebath, are shown. Attempts to provide a quantitative theoretical explanation of the experimental facts about the rate of dyeing are discussed. The picture of dye diffusion in cellulose is described, which seems to be emerging as a result of recent work. 5 tables, 5 figures, and 27 references. E.S.

PRESTON, J. M., and SU, Y. F. The cellulose-dye complex. Part IV. The polarised fluorescence from dyed fibres. J. Soc. Dyers Colourists 66, no. 7: 357-61 (July, 1950); *cf.* B.I.P.C. 17: 413.

Studies have been made of the relation between the degree of orientation of dyed regenerated cellulose fibers and the degree of polarization of their fluorescence under various conditions. It is shown that, with certain precautions, the fluorescence method gives a measure of the dichroism of the dyed fibers and is a simple and accurate method of evaluating dichroism. 3 tables, 4 figures, and 14 references. E.S.

PRESTON, J. M., and TSIEN, P. C. The cellulose-dye complex. Part V. A comparison of orientation factors derived from dichroism and other parameters. J. Soc. Dyers Colourists 66, no. 7: 361-5 (July, 1950).

The authors show that an orientation factor can be derived from the dichroism of dyed fibers. Orientation factors of certain regenerated cellulose fibers derived by different methods are compared. Values are quoted for the orientation factors of the same fibers derived from polarized fluorescence,

dichroism, birefringence, x-rays, and swelling anisotropy. 2 tables, 5 diagrams, and 16 references. E.S.

ETHICS

CUNNINGHAM, JAMES D. Technical knowledge is not enough. Paper Trade J. 131, no. 9: 26-7 (Aug. 31, 1950); Paper Mill News 73, no. 38: 23-4 (Sept. 23, 1950).

The author points out the necessity for achieving a balance between technical, spiritual, and moral forces, rather than complete concentration on technical progress, in order to insure the survival of our economic society. J.A.B.

FEED WATER

NORMAN, E. B. Industrial water conditioning. Pulp Paper Mag. Can. 51, no. 8: 89-91 (July, 1950).

The boiler feed-water treatment at the Ottawa mill of the E. B. Eddy Co. is outlined. E.S.

FIBER—STRUCTURE

LÜDTKE, M. Morphology and chemistry of the cell wall of plant fibers. Holzforschung 4, no. 3/4: 65-78 (1950). [In German]

A review with 97 references is presented. 1 diagram and 4 tables. L.E.W.

MÜHLETHALER, KURT. An electron microscopic study of the structure of viscose silk. Experientia 6, no. 6: 226-8 (June, 1950). [In English; German summary]

The changes in the fine structure of a commercial viscose rayon during solution and regeneration were followed by means of the electron microscope. Viscose fibers were found to have a very heterogeneous composition; breakdown products with typical cell-wall structure and larger swelled fibrils are embedded in a fine substance which has a visible structure and which must, therefore, consist of particles which are associations of numerous cellulose molecules. Lignin, pectin, and the other substances which accompany cellulose in the original fibers seem to have been completely dissolved. Electron pictures indicate that cellulose does not go into "solution" as individual molecules, but as molecular groups and larger fragments. On extrusion into the precipitating bath, these fragments form the cement uniting the other undissolved components. The exterior surfaces of the fibers appear smooth, because all holes and fissures have been filled during the extrusion process. From the foregoing results it is understandable that the tensile strength of the viscose fiber should be significantly less than that of native cellulose. The main chain length is considerably shortened during the early ripening process and the later solution. It is scarcely conceivable that fibers built up from an admixture of regenerated, short filaments and undissolved fragments should equal in strength the original cellulose. 5 figures and 9 references. E.S.

FIBERS

CLARK, GEORGE L. Comparative degrees of preferred orientation in nineteen wood pulps as evaluated from x ray diffraction patterns. Tappi 33, no. 8: 384-6 (August, 1950); Pulp Paper Mag. Can. 51, no. 9: 90-2 (August, 1950); *cf.* B.I.P.C. 20: 488.

Continuing the x-ray diffraction analysis of wood pulps, and supplementing the five unbleached kraft pulps, 14 additional pulps have been investigated, representing other wood types and the effects of bleaching and processing. The 19 pulps are compared as to the degree of preferred orientation of celiu-

lose chains in the fibers, ranging from unbleached Douglas-fir with very high orientation to some bleached pulps with very nearly random arrangement. The order for the first five pulps is compared with the respective orders for five other measured properties, with a fairly close correlation except for loblolly pine. Qualitative observations are made on crystalline and amorphous phases in these pulps. The work described in this report is to be considered as preliminary in nature. The significance of the results and particularly of the low order of orientation for Mitscherlich pulps is receiving further study. 2 tables, 1 figure, and 5 references. E.S.

HAYWOOD, GERALD. Effect of variations in size and shape of fibers on papermaking properties. Tappi 33, no. 8: 370-83 (August, 1950); Pulp Paper Mag. Can. 51, no. 9: 77-89 (August, 1950).

The data presented by the author are arranged in three broad sections: (1) a list of the variations in the length of fibers from coniferous and deciduous woods and a classification of various deciduous woods according to the wall thickness of their libriform fibers; (2) presentation of data to show how variations in fiber length and wall thickness affect such properties as tearing, bursting, and folding strength, bulk, and opacity; and (3) presentation of data to show that each of the process steps used to reduce wood to pulp plays an important role in determining the ultimate quality and papermaking properties of a pulp. 33 tables. E.S.

HEATH, MERLE A., and JOHNSON, MARIAN M. The proportion of water-accessible and nonaccessible cellulose in wood pulps. Tappi 33, no. 8: 386-91 (August, 1950); Pulp Paper Mag. Can. 51, no. 9: 98-103 (August, 1950).

The method of Wink (*cf.* B.I.P.C. 16: 454-5; 17: 421) affords a simple and reliable procedure for determining the equilibrium moisture content of wood pulps or other cellulosic materials over a wide range of relative humidity. Absorption moisture regain (after drying over phosphoric anhydride) at 73° F. at intervals between 11.1 and 86.5% R.H. has been determined for commercial cotton fiber, purified cotton linters, and a series of wood pulps prepared from softwoods and hardwoods by the sulfite, Mitscherlich, and kraft processes; bleached and unbleached pulps were studied. The isotherm derived by Hailwood and Horrobin has been applied to the data as a means of calculating the relative proportions of the material which are accessible and inaccessible to water. The results indicate that wood pulps comprise a class of native cellulosic fibers having a water accessibility which is distinctly higher than that of cotton and much lower than that of mercerized or regenerated cellulose. Different wood pulps show minor variations in accessibility, as do different samples of cotton and cotton linters or different regenerated cellulose samples. In some cases these differences are within the limit of error of the method. The number of samples tested in this work are hardly sufficient to draw any definite conclusions regarding accessibility and different pulping processes or types of pulpwood. The accessibility of poplar pulp appeared to be lower than that of the softwoods. In general the effect of bleaching on the over-all accessibility of the wood pulps to water was not significant. There was an indication that the drying process may have an effect on the accessibility. 7 tables, 3 figures, and 16 references. E.S.

LEWIS, HARRY F. Fiber surface effects in their relation to papermaking. Tappi 33, no. 8: 418-24 (August, 1950); Pulp Paper Mag. Can. 51, no. 9: 124-9, 103 (August, 1950).

The purpose of this paper is to relate the current knowledge of the arrangement of cellulose and the isotropic material in the primary and secondary walls of the fiber to the papermaking process, as these are determined by the electron microscope and cinephotographs. It is rather certain from the evidence, that the cambial wall is a network of fibrils, and that

the secondary wall has parallel bundles of fibers of the same general dimensions. Beating removes two materials, namely, the primary wall material on the fiber and a portion of the outer zone of the secondary wall to permit extensive swelling of the middle zone of the secondary wall. The ordinary course of beating involves only the beginning of this process. Beating for glassine carries the process more nearly to completion. Degradation of the fiber by oxidation or acid hydrolysis greatly lowers the stability of the materials constituting these two areas of the fiber structure to the point where the fiber falls apart under mechanical treatment. The presence of mannan in the limiting wall of the fiber is described. Whether this mannan fraction is responsible for the haze in solutions of cellulose acetate from wood pulps is not known but is strongly indicated. 11 figures and 19 references. E.S.

MASON, S. G. The electrokinetic properties of cellulose fibers. Tappi 33, no. 8: 413-17 (August, 1950); Pulp Paper Mag. Can. 51, no. 9: 119-23 (August, 1950).

Certain modes of behavior of papermaking fibers are often attributed to the effect of the charge of the electrical double layer, by analogy with the classical theories of colloid stability. Such explanations should be employed with caution. The methods of measuring the zeta-potential of cellulose fibers by streaming and electro-osmosis are discussed, and it is shown that, on the grounds of faulty experimental methods and of limitations in the electrokinetic theory of fibers, the significance of the reported data in the literature is doubtful. Unlike many systems, the origin of the electrical charge in cellulose fibers is obscure. The possible application of electrokinetic measurements to the study of the dimensions of surface layers is briefly discussed. 3 tables, 4 figures, and 21 references. E.S.

VAN DEN AKKER, J. A. The elastic and rheological properties of papermaking fibers; some of the problems to be met in developing an analytical approach to the subject. Tappi 33, no. 8: 398-402 (August, 1950); Pulp Paper Mag. Can. 51, no. 9: 104-8 (August, 1950).

Fiber-to-fiber bonds probably have rheological properties; however, the thickness of a zone of bonding is so slight that, as a first approximation, it seems reasonable to assume that the strain occurring at a bond is essentially that of the associated fibers. Thus far, the work on rheological and elastic properties of paper has been done with the view that paper is to be regarded as an entity; that is, various investigators have treated paper as a sheet of material without regard for analysis of the influence of its components and the effect of its structure on the observed macroscopic properties. It is generally agreed that the strength of a typical paper resides primarily in the fiber-to-fiber bonds. The several theories of binding are discussed. Closely associated with the number of fiber-to-fiber bonds is the bonded area, the methods of measurement of which are under question. Ultimately, it is desirable to compute the appropriately averaged stress and strain in the fibers and the average shear stress in the fiber-to-fiber bonds. Flexural rigidity of the fibers and the effect on the sheet are considered. The various factors are discussed and suggestions for an approach to the general problem are made. 1 figure and 21 references. E.S.

FLAX

BESSER, E., MONTONNA, R. E., and SMITH, F. Chemical delignification of flax straw and other cellulosic materials. Nature 166, no. 4213: 195-6 (July 29, 1950).

The authors have found that one treatment of seed-flax straw or roving

for two hours at 155° C. under pressure with an aqueous solution containing 2% sodium hydrosulfite and 2% sodium hydroxide results in complete extraction of the lignin. The residual cellulose fibers can be readily spun into yarn. Aside from its possible industrial application in the linen industry, the alkaline hydrosulfite reagent enables the constituents of cellulose to be separated and investigated. This method may also be used for the delignification of grains, leaves, straw, and possibly wood. 8 references. J.A.B.

FOLDING BOXES

"ESTEVAN." An improved method of sample making. Paper Box Bag Maker: 15-17 (July, 1950).

A procedure is described for producing a facsimile of a die-cut carton. A list is given of the materials required, and the method of operation is outlined. 4 figures. J.A.B.

LILLIE, A. R., and BETTENDORF, HARRY J. Folding carton industry statistics. Fibre Containers 35, no. 8: 161-2, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184-7 (August, 1950); *cf.* B.I.P.C. 20: 83-4.

The fact that 1947 was the peak year for the folding box industry in the decade 1940-49 and that it suffered two consecutive years of a decline since then on a dollar basis as well as according to tonnage-consumption charts (where 1946 was the peak year), is taken as an indication that the industry has lost its youthful rate of growth and is now in its early maturity; it has therefore become more susceptible to the variations of general economic conditions. The industry consumed 2,076,208 tons of folding boxboard in 1949 or 3% less than in 1948, 7% less than in 1947, and 9% less than in 1946. Statistical data are presented in numerous tables and graphs, chiefly covering the last ten-year period. The general nature of the industry has always been characterized by a relatively high degree of stability; in periods of economic stress, it usually resists downward trends and rises steadily, but less spectacularly, in periods of general rise. One of the reasons for this stability lies in the fact that folding cartons are used largely for consumer necessities, which tend to maintain a steadier keel than other goods. E.S.

FORESTS AND FORESTRY

GILLETT, CHARLES A. Incentives of practical forestry. Paper Trade J. 131, no. 7: 27-8, 30, 34 (Aug. 17, 1950).

There is no exact time or place from which the history of the development of scientific forestry can be traced, but its growth was coincident with the development of the pulp and paper industry, around the turn of the century. Today 35-40% of the commercial forest lands of the U. S. is under scientific management, and this figure is increasing steadily. Utilization practices are also improving; as a result of the correlated manufacture of many products, the volume of wood utilized in each tree has increased, in some cases, from 30 to 70%. Mention is made of the contributions of a few of the 1500 organizations, including colleges, trade associations, public agencies, manufacturers, processors, and professional societies, engaged in research aimed at greater wood utilization. 7 figures. J.A.B.

JOHNSON, R. S. Silviculture as applied through cutting methods by Mersey Paper Company Ltd. Pulp Paper Mag. Can. 51, no. 8: 103, 106, 108, 110-12 (July, 1950).

The author discusses the selective cutting policies of the company which

have been used on nearly all operations since 1945. The advantages and disadvantages are outlined. 4 tables, 2 figures, and 8 references. E.S.

MCCAFFREY, J. E. A forestry program for the pulp & paper industry. Pulp Paper Mag. Can. 51, no. 8: 114-16, 118 (July, 1950).

The author discusses the problems encountered by the pulpwood industry in 11 southern states and the creation and activities of the Southern Pulpwood Conservation Association, which devotes its full time to encouraging landowners and wood suppliers of all descriptions, particularly pulpwood operators, to care for and treat trees as a crop. E.S.

GROUNDWOOD PULP

SCHAFER, E. R., and HYTTINEN, AXEL. Effect of the moisture content of wood on the groundwood pulping of white spruce and quaking aspen. Paper Trade J. 131, no. 5: 26-9 (Aug. 3, 1950).

Groundwood pulping experiments were made at the U. S. Forest Products Laboratory on spruce and on quaking aspen ranging in moisture content from that of nearly green wood to about 11%. Under the same grinding conditions, a decrease in the moisture content of the wood tended generally (*a*) to decrease freeness and fiber length of both the spruce and aspen pulps, (*b*) to decrease bursting and tensile strengths of the spruce pulps, but to increase these strengths in the aspen pulps, and (*c*) to increase the energy consumption in most cases. For pulps of equal freeness, the energy consumption tended generally to decrease, the grinding rate to increase, and the bursting and tensile strengths to decrease as the moisture content of the wood decreased. The differences caused by changes in moisture content were generally much greater at higher than at lower freenesses. 2 tables and 2 figures. J.A.B.

HISTORY

ANON. The ancient craft of paper marbling. Papetier 4, no. 5: 81, 83, 85, 87: no. 6: 19-21 (May, June, 1950). [In French]

The processes and equipment are described which were used by the workers who produced and traded marbled papers in different styles and patterns (Dominotiers) in the old kingdom of France. Reference is made to the regulations and limitations of this old craft; the members had to be registered and were not allowed to use their presses for the printing of books, to keep any type, or to sell books or any kind of printed matter. In addition, the regulations of the old professions of distemper painting and the preparation, painting, and decoration of paper fans are outlined. The information is taken from Jaubert, "Dictionnaire des arts et des métiers." E.S.

ANON. The type of goods carried by a paper merchant before the French revolution. Papetier 4, no. 7: 19, 21, 23, 25 (July, 1950). [In French]

The supplies carried by a paper merchant in the 18th century usually included all kinds of paper and writing materials, such as ink, pens, sealing wax, and sealing wafers, and, in addition, leather articles and fancy goods of all kinds. All items were at first more crude and less numerous than in the later periods. 1 illustration. E.S.

DONNELLY, FLORENCE. First in the West. Paper Maker [U. S.] 19, no. 2: 1-9 (September, 1950).

The story is told of Peter and James Brown, who successfully overcame obstacles to produce strawboard on the Pacific Coast in 1879 and were pioneers in the paperboard industry of the West. Their last venture, the Southern Board and Paper Mills in Los Angeles, is now a division of Fibreboard Products, Inc. Numerous illustrations. J.A.B.

ELLIOTT, HARRISON. Connecticut's first papermaker. Paper Maker [U. S.] 19, no. 2: 41-3 (September, 1950).

The first paper mill in Connecticut, which produced printing, wrapping, cartridge, and sheathing papers, was erected at Norwich in 1766 by Christopher Leffingwell. In the beginning it operated with financial aid from the government, and the annual production was 1300 reams. Leffingwell's accomplishments in industry and as a leader in his community are mentioned briefly. J.A.B.

ELLIOTT, HARRISON. Dramatic moments in the romance of paper. Inland Printer 125, no. 5: 70-4 (August, 1950).

The most important papermaking development since its origin in China was the invention of the papermaking machine by Nicolas-Louis Robert in 1799. The first paper machine to operate in this country was erected by Thomas Gilpin in Wilmington, Delaware, in 1817. Other notable events in the history of paper are the inventions of the groundwood process, the sulfite process, the sulfate process, and the processes for producing coated and enameled papers, weatherproof paperboard, newsprint from Southern pine, Bible paper directly from flax, and wet-strength paper. The dates and details of each of these are given. J.A.B.

SULLIVAN, FRANK. The most expensive paper in America. Paper Maker [U. S.] 19, no. 2: 33-9 (September, 1950).

The paper used for the first printing done in America was brought to this country in 1638 by the Reverend Joss Glover, who bought a printing press and 240 reams of very poor rag paper in England and moved to Massachusetts. The author set out to trace this paper, and he has succeeded in accounting for every ream. The majority of it was used for printing copies of the Bay Psalm Book, one of which was recently sold for $151,000. 7 illustrations. J.A.B.

VOORN, H. Nicolas-Louis Robert. Papierwereld 4, no. 11: 11-14 (Christmas no., 1949); Tech. Bull. Brit. Paper and Board Makers' Assoc. 26, no. 10-12: 54-5 (October-December, 1949). [Original in Dutch; condensed translation in English]

A biography of the inventor of the paper machine is presented. 4 illustrations in the original and 5 references. E.S.

WESCHER, HERTHA. Sizing of paper in Nicolas Robert's time. Papierwereld 4, no. 11: 18-19 (Christmas no., 1949); Tech. Bull. Brit. Paper and Board Makers' Assoc. 27, no. 1-3: 4 (January-March, 1950). [Original in Dutch; condensed translation in English]

The preparation of the size and the procedures for sizing paper at the time of Nicolas Robert are described; gelatin was the most generally used agent, although fish glue was also known, but its price allowed its use only in luxury papers. 2 illustrations in the original. E.S.

INSTRUMENTATION

SHOLL, HAROLD. Instrumentation in paper mills. Tappi 33, no. 8: 68-74A (August, 1950).

The talk consisted of an explanation of a number of lantern slides showing various instrument applications; the discussion following this talk is reprinted in condensed form. E.S.

INSULATION AND INSULATING MATERIALS

ANON. Acoustic materials. Tech. News Bull. Natl. Bur. Standards 34, no. 7: 96-102 (July, 1950).

A brief review is given of the essential theories underlying acoustic materials and some of the principles governing their use. The types of acoustic materials include prefabricated tiles, acoustic plasters, sprayed-on materials, and acoustic baffles. In order to specify the amount of an acoustic material to be used, the sound-absorption coefficients must be determined; this may be done by the reverberation-chamber method, the impedance-tube method, or the box method, each of which is described. The painting of acoustic materials should be done with a spray, and extreme care is necessary. 8 figures and 6 footnotes. J.A.B.

IONOGRAPHY

MCDONALD, HUGH J., URBIN, MATTHEW C., and WILLIAMSON, MARTIN B. Measurement of ion migration on paper in an electric field. Transference numbers of nickel and copper sulfates. Science 112, no. 2904: 227-9 (Aug. 25, 1950).

The method described for the separation of various organic and inorganic compounds is based on electrophoresis and involves a strip of filter paper which serves as a path along which ions or charged particles migrate under the influence of a potential gradient. The apparatus is described and illustrated. A solution of the material to be studied is placed on the filter paper, which has been previously dampened with potassium chloride solution, midway between the two end electrodes, and the circuit is closed for 3-6 hours. The paper is then dried, and the position of the ions is determined by the use of colorimetric agents. The ion mobilities and transference numbers of nickel sulfate and copper sulfate are tabulated. Preliminary experiments indicate that the isoelectric point of proteins can be determined, and amino acids and proteins can be separated by this process, called ionography. 1 table, 1 figure, and 3 references. J.A.B.

KRAFT PULP AND PAPER

GALL, A. M. The production of bituminous kraft as a profitable means of extending the usefulness of an old paper machine and rejected machine clothing. Pulp Paper Mag. Can. 51, no. 8: 87-8 (July, 1950); Paper-Maker (London) 120, no. 3: 183-4 (September, 1950).

The author describes the operation of a Walmsley paper machine dating from 1890 and other obsolete equipment during wartime for producing a bituminous kraft paper with innumerable uses. E.S.

PRICE & PIERCE LTD. Sulphate pulp production in North America. Can. Pulp Paper Ind. 3, no. 8: 14, 16, 104 (August, 1950).

Brief reference is made to the rapid rise of sulfate production during recent years, which is based almost entirely on the expansion in North

America. In 1949, the production of unbleached sulfate dropped slightly, but the bleached grades continued to climb upward and reached 1,384,000 and 365,000 tons for the United States and Canada, respectively. New production in both countries will increase bleached capacity in 1950 still further. The estimated consumption of all grades of sulfate pulp in North America in 1949 is over 7,000,000 short tons. American sulfate pulp can be classified into northern, western, and southern types, all three of which have individual characteristics. Board accounts for the largest share in the consumption of unbleached pulp. Bleached sulfate finds a variety of uses, either alone or blended with other pulps; in several cases it has replaced bleached sulfite. It is also used as bleached or semibleached pulp in newsprint in the place of sulfite. E.S.

LACQUER AND LACQUERING

GARDNER, WM. HOWLETT. Coatings; recent developments. Modern Plastics Encyclopedia and Engineer's Handbook, 1950: 784-6 (1950).

A review of recent developments in new resins for coatings, drying oils, miscellaneous additives, pigments, and fire-retardant paints and lacquers for various bases is given. 90 references. Additional information on materials for coatings and applications of coatings (not by the same author and not included in the above paging) is similar to that published in previous editions of the *Modern Plastics Encyclopedia.* E.S.

KRONSTEIN, MAX, WARD, MARION M., and ROPER, ROBERT. Evaluation of organic coatings by electrographic printing. Ind. Eng. Chem. 42, no. 8: 1568-72 (August, 1950).

The application of the electrographic printing method for the detection of the permeability and underfilm spreading of moisture of organic coatings gives new means for the rapid evaluation of these coatings under many conditions and in conjunction with many of the usual test methods such as salt-fog exposure, Weather-Ometer exposure, and others. The method has been used successfully over a period of nearly three years in the Paint Research Laboratories of New York University in the development and evaluation of new coatings and modifications of commercial coatings. The work reported herein is concerned with new applications of the electrographic printing method for the testing of the moisture permeability and the underfilm spreading of moisture on organic coatings. 9 figures and 6 references. E.S.

LEGIBILITY

HOWLETT, HENRY J. Design's critical eye. Modern Packaging 23, no. 12: 74-6 (August, 1950).

A new machine is described which scientifically measures the threshold of recognition of package design. The "Visualator" consists of a specially designed, air-cooled slide projector equipped with a variable-speed shutter, with release, and calibrated dials moving on worm gears, controlling the mechanisms affecting light intensity and image focus. Color photographs are taken of a package or group of packages, transferred to Kodachrome slides, and projected on a screen while the illumination and focus are varied; observers determine the point where the package becomes identifiable and legible. The machine is useful in evaluating designs and in making comparison tests with competitive products. 8 illustrations. J.A.B.

LIME AND LIMESTONE

GIBBS, RALPH. Fundamentals of lime kiln thermodynamics. Paper Ind. 32, no. 5: 501-4 (August, 1950); *cf.* B.I.P.C. 20: 643.

The author discusses kiln-gas temperatures *vs.* kiln length for different diameters, kiln diameters *vs.* flame length for coal and oil, fuel rates for varying kiln diameters, weight of kiln gases evolved per hour in kilns of different sizes, and heat transferred from kiln gases to kiln-shell surfaces. The treatment is mathematical. 5 tables and 6 diagrams. L.E.W.

LUBRICATION AND LUBRICANTS

ANON. Practical lubrication suggestions. Paper Mill News 73, no. 33: 36, 38 (Aug. 19, 1950).

Twelve questions and answers on lubricating problems are presented. E.S.

MACINTYRE, FRANK E. The significance of lubrication specifications. Pulp Paper Mag. Can. 51, no. 8: 92-3 (July, 1950).

The author emphasizes that lubrication specifications do not indicate lubricating quality, but are set up by the manufacturers to control the uniformity of their products. The best rule in the selection of suitable lubricants is the guidance offered by the experience of the user and the experts of the oil company. E.S.

MILLER, WALTER S. Lubricants for anti-friction dryer roll bearings. Paper Mill News 73, no. 33: 76, 87 (Aug. 19, 1950); *cf.* B.I.P.C. 20: 871.

Reference is made to the use of a Falex wear tester at 300° F. for the measurement of the film strengths of oils at temperatures which may be encountered in continuously lubricated spherical roller bearings on high-speed paper machines. The data (average of 12 tests) indicate that conventional mineral oils without additives will break at this temperature, whereas the same base oils with the addition of an oxidation and water-corrosion inhibitor will withstand it. Dispersive-detergent additives, such as are commonly used in Diesel engines, increase the film strength of the lubricant and have given excellent results in high-temperature paper-machine service, where rates of flow and bearing-housing design prevent adequate flushing of the system by mechanical action. 1 table. E.S.

MACHINERY

WOOD, J. L. Developments in wet end auxiliary equipment for paper making machines. World's Paper Trade Rev. 134, no. 3: 173-80, 185 (July 20, 1950).

The author discusses recent developments and various types of pulp-cleaning equipment, including screens and rifflers, centrifugal machines (Erkensators and Purifuges) followed by classifiers, such as Vortraps or Dirtecs; materials of construction for pulp-conveying installations; pulp filters, washers, or thickeners; rotary screens with auxiliary screens for treating tailings or rejects; save-alls; stock pumps; piping layouts; valves; and vacuum pumps and gages. 8 figures. E.S.

MACHINERY—BEARINGS

SKINNER, E. S. Development of anti-friction bearing paper machine dryers. Paper Mill News 73, no. 34: 10-11, 18 (Aug. 26, 1950); Paper Trade J. 131, no. 5: 24-6 (Aug. 3, 1950); Paper-Maker (London) 120, no. 3: 178-80 (September, 1950).

The author discusses the special features of the three most commonly selected types of roller bearings: the straight cylindrical, the tapered, and the spherical roller bearing, their maintenance, and lubrication. E.S.

MACHINERY—BEATERS

CEUTERICK, P. A new beating apparatus. Papierwereld 4, no. 14: 246-8 (Feb. 1, 1950); Tech. Bull. Brit. Paper and Board Makers' Assoc. 27, nos. 1-3: 1-2 (January-March, 1950). [Original in Dutch; abstract in English]

An illustrated description is given of a new beating apparatus which has the same capacity as a hollander. It consists of three main sections: a riveted iron framework, a rotating outer drum, and an inner rotor. The rotor and the drum are driven in opposite directions by separate motors. The pulp at 7% consistency and the water are fed from one end of the drum and, after beating, are discharged at the opposite end. The beating action can be varied by changing the quantity of pulp fed through the machine and by altering the angular speed of the rotor. Comparative tests on sheets made from pulp treated in the new machine and an ordinary beater indicate that the former have appreciably higher bursting and tensile strengths, but lower tearing strengths than the latter. Advantages claimed for the new apparatus are continuous operation, uniform beating, moderate power consumption, and complete disintegration of tailings. 3 figures. E.S.

MACHINERY—BELTING

GAHL, E. A. Tips on proper care of V-belt drives. Paper Mill News 73, no. 33: 66, 68, 96 (Aug. 19, 1950).

Directions for the correct installation and maintenance of V-belt drives are given. Unusual working conditions call for special belts, and acid, alkali, or oil-resistant V-belts, as well as static-dissipating types for applications in an explosive atmosphere can be supplied. 8 illustrations. E.S.

MACHINERY—CONVERTING MACHINERY

HAMILTON, GEORGE. Plenty up their sleeves! Shears 68, no. 692: 8-9, 62 (August, 1950).

The Card-Tube Machine designed by the Quality Park Box Co., St. Paul, for producing sleeve-type box covers consists of a wheel-shaped spider with seven extended mandrels at evenly spaced intervals. This mechanism takes the blanks, which have been scored and edge-glued, through seven operations, after which the completed sleeves are ejected at the rate of 1000 pieces per hour. 4 illustrations. J.A.B.

MACHINERY—CORRUGATING MACHINE

ROSELIUS, L. W. Corrugating improvements by S&S. Fibre Containers 35, no. 8: 158-60 (August, 1950).

The developments in the design of modern corrugators by the S&S Corrugated Paper Machinery Co. during the last 25 years are discussed, even though the basic principles of corrugating and combining board have changed only slightly. The modern machines are substantially wider, longer, and heavier, and are precision-built to tolerances unknown 25 years ago; they operate at speeds of over 500 ft./min. Improvements and developments in overhead cranes and grabs, lift trucks, shaftless roll stands, the triplex slitting and scoring unit, the duplex cut-off, and a new sheet stacker and delivery system in connection with corrugators are described briefly. Refer-

ence is also made to a number of auxiliary S&S boxmaking machines which have contributed materially to the progress of the corrugated container industry. 8 illustrations. E.S.

MACHINERY—CUTTERS

ANON. Taylor, Stiles & Co.—cutting machine specialists to the paper industry. Paper Trade J. 131, no. 9: 24-6 (Aug. 31, 1950).

Among the organizations serving the paper and pulp industry is Taylor, Stiles & Co. of Riegelsville, N. J., manufacturers of superior cutting machines and knives. The organization, personnel, equipment, and products of this company are discussed. The No. 36 and No. 11 Giant cutters and No. 20 Multiplex machine are described and illustrated. 6 illustrations. J.A.B.

MACHINERY—DRIVE, ELECTRIC

MIKELSON, W. Electronic paper machine drive control. Pulp and Paper Manual of Canada 18: 9-13, 15, 17, 19 (1950).

The author describes performance measurements on the modern electronic amplidyne speed regulator for paper machine drives. The measurements show the high accuracy, stability, and fast response of these drives under normal as well as severe operating conditions of load, power-system frequency, and voltage variations. Twenty complete sectional drives involving approximately 200 sections are now installed and operating. The experience obtained with them confirms the above measurements and indicates that the drive is economical, simple to install and operate, low in maintenance, and reliable in performance; it provides continuous quality production at top paper-machine speeds. 13 figures. E.S.

MACHINERY—DRYERS

THE SPOONER DRYING AND ENGINEERING COMPANY LIMITED. The Spooner system of drying paper and board. Pulp and Paper Manual of Canada 18: 89, 91 (1950); *cf.* B.I.P.C. 20: 873.

Three Spooner drying units are described: one on a board machine, one on a machine making coated paper, and one unit formed into a hood on a Yankee cylinder. 3 figures. E.S.

MACHINERY—ELECTRIC EQUIPMENT

CUTCHINS, A. P. Costly mechanical failures emphasize vital need of maintenance study. Southern Pulp Paper Manuf. 13, no. 8: 20, 50 (August, 1950).

The author emphasizes the importance of routine inspection and maintenance for all electrical motor equipment and gives useful directions for the systematic control check of vital points. E.S.

MACHINERY—FELTS

WOODSIDE, L. M. Fourdrinier machine felt problems. Tappi 33, no. 8: 74-5A; discussion: 76A (August, 1950).

The author describes the types and weaves of felts used on Fourdrinier machines, common troubles encountered (like filling up and shadow or suction-hole marking), and ways and means for overcoming them. The efficiency of the machine should be taken as a measure to determine the best felt to use on any particular position. E.S.

MACHINERY—PRINTING MACHINE

ANON. The production of rubber printing rollers and stereos in the modern manner. Paper Box Bag Maker: 19-20 (July, 1950).

The recently formed Brenchley Engraving Co. Ltd., of Kingston-on-Thames specializes in the manufacture of engraved rubber printing rollers, rubber stereos, and machine engraving. The work carried out in the various departments of the company is outlined. 1 illustration. J.A.B.

PEEDE, LORING G. Envelopes that fly quicker than the eye. Paper & Paper Products 91, no. 21: 1, 7, 13 (July 20, 1950).

Reference is made to a new high-speed envelope printing machine for finished envelopes, which was developed by Robert Lauffer of the Miller-Lauffer Printing Equipment Corp. The fast kiss impression eliminates drying and offset problems, even with regular grade inks, and the impressions are always sharp. The maximum running speed is about 100,000 envelopes per hour; the service possibilities for large rush orders are discussed. Plate changes can be made rapidly and no make-ready is required, so that favorable returns can also be expected from smaller lots. The design of the new press is described briefly. 1 illustration. E.S.

MACHINERY—SAVE-ALLS

ANON. Savealls at Salem; experience with them reported. Pulp & Paper 24, no. 9: 84 (August, 1950).

Reference is made to the successful operation of two Sveen-Pedersen savealls installed on two fine paper machines in the mill of the Oregon Pulp & Paper Co., Salem, Ore. Each of these recovery units handles white water at the rate of 800-1000 gallons per minute, reducing the solids content to less than 0.2%. The solids recovered by flotation are returned to the machine chests, and the clarified water is exhausted to storage chests for subsequent use in dumping the beaters. Only a small excess of clarified water is discharged into the river. A third unit has recently been installed at the Columbia River Paper Mills, Vancouver, Wash., which is under the same management-ownership. 2 illustrations. E.S.

MACHINERY—SAWS

LEVESQUE, HIDOLA, and LAMOTHE, G. E. Report on the use of the mechanical saw. Pulp and Paper Manual of Canada 17: 78-81, 83, 85 (1949).

A comparison of the output of mechanical and bucksaws, using one to three men in the tests, was made, and the results of the time studies are presented in tabular form. Although it is felt that mechanical saws have a definite place in four-foot pulpwood conventional logging, training and experience are required by the user. To introduce such saws on a larger scale, the better men should be encouraged to buy them and practice with them, guided by competent instructors. 11 tables. E.S.

MACHINERY—SCREENS

GREIDER, H. W., MACARTHUR, R. A., and GISCHIG, L. C. Rotary screen for laboratory separation of shives from mechanically prepared wood pulp. Paper Trade J. 131, no. 9: 21-4 (Aug. 31, 1950).

An illustrated description is given of a laboratory screen for the separation

of shives according to their lateral dimensions from mechanically prepared wood pulp. The procedure is outlined, and the test results are given, using heat-treated Asplund defibrated, mixed hardwood (containing oak, cottonwood, poplar, and catalpa), softwood (predominantly New Jersey pine), and heat-treated mixed hardwood. The use of this screen in conjunction with the Bauer-McNett classifier, which evaluates fiber length, affords substantially complete estimation of the dimensional characteristics of mechanical wood pulp. 9 figures. J.A.B.

LINDGREN, KARL. The Jönsson-Lindgren screen. Svensk Papperstidn. 53, no. 13: 366-8 (July 15, 1950). [In Swedish; English summary]

The Jönsson-Lindgren vibrating screen (model L constructed in four sizes) is based on the experience gained with the earlier Jönsson vibrating screen. It consists principally of a rotating and vibrating drum operating in a vat. It differs from the older types of rotary screens by higher vibration frequencies which result in higher capacities. A minimum of power is required, and the screen can be operated at consistencies as high as 3-3.5%. About 150 Jönsson-Lindgren screens are in successful operation on bleached and unbleached sulfite and sulfate pulps, as well as on all kinds of paper stock. 3 figures. E.S.

MACHINERY—SUCTION ROLLS

HARPER, JOHN C. Effective maintenance on paper mill rolls. Paper Mill News 73, no. 33: 58-9, 62, 64 (Aug. 19, 1950).

Directions are given for the effective maintenance of plain and suction extractor rolls, suction couch, drum, and press rolls, rubber-covered rolls, and suction felt rolls. The importance of adequate and proper lubrication of the equipment is emphasized. 6 illustrations. E.S.

MATERIALS HANDLING

ENGINEERING PRODUCTS CORPORATION, *Chicago*. The T-127 for unloading newsprint from freight cars. Pulp Paper Mag. Can. 51, no. 8: 146 (July, 1950); *cf.* B.I.P.C. 20: 647.

The turntable described in the previous reference for unloading corrugated rolls is applied to the handling of newsprint rolls. 4 illustrations. E.S.

MATERIALS OF CONSTRUCTION

ARMCO STEEL CORPORATION. Efficient operation with stainless steels. Paper Mill News 73, no. 33: 89-90 (Aug. 19, 1950).

A recent survey in the pulp and paper industry indicates that the amount of stainless steel now purchased annually by paper mills and equipment manufacturers is almost double that in 1940. New grades to meet specific problems are continually developed, such as the low-carbon grades 304 ELC and 316 ELC, and two grades of precipitation-hardening stainless steels Armco 17-4 PH and 17-7 PH. Maintenance costs of stainless-steel equipment are low, because the hard, dense, corrosion-resistant surfaces are easy to clean. The equipment, however, will give better and longer service if proper care is taken of it. Useful suggestions for the cleaning and maintenance of stainless-steel surfaces are included. 5 illustrations. E.S.

MACKENZIE, B. G. Stellite in the pulp and paper industry. Pulp and Paper Manual of Canada 17: 109, 111, 113, 115 (1949).

The physical characteristics of stellite, an alloy of cobalt, chromium, and tungsten, are described, and uses in the pulp and paper industry are outlined, including pump shafts and sleeves, top and bottom shear-type slitters, chipper bed knives, cutting tools, nozzles for recovery furnaces and hydraulic barkers, valve seats and disks, hog anvils, and similar applications. 6 illustrations. E.S.

MOTT, N. S. Materials selection chart. Chem. Eng. 57, no. 8: 197-200 (August, 1950).

A chart is presented which is designed to assist in the selection of the most economical material satisfactory for resistance to corrosive media. Ordinary carbon steel is included together with more expensive construction materials, which are listed in order of increasing cost. E.S.

METERS AND RECORDERS

PRECISION THERMOMETER AND INSTRUMENT COMPANY, *Philadelphia.* New Princo Densitrol provides novel method of controlling the density of flowing liquids. Pulp and Paper Manual of Canada 17: 115, 117 (1949).

The operating principle of the new Princo Densitrol and typical processing applications, including the pulp and paper industry, are described. E.S.

MILL MANAGEMENT

BEEDLE, PAUL W. Teamwork today. Paper Mill News 73, no. 34: 22-3 (Aug. 26, 1950).

Useful directions for securing teamwork in the increasingly complex modern life are given. 2 tables. E.S.

MOORE, JAMES D. How well do you handle your women? Shears 68, no. 692: 14, 16 (August, 1950).

The author points out that women are valuable employees, but the ways in which they differ from men physically and psychologically must be understood in order to deal with them satisfactorily. J.A.B.

SUTHERLAND, JAMES E. What does maintenance cost? Paper Mill News 73, no. 33: 93-4 (Aug. 19, 1950).

American industry spent over 8.6 billion dollars on maintenance and repairs during 1948, as compared with 5.4 billion in 1946 and 7.2 billion in 1947. A detailed analysis was made of the net sales, gross and net fixed assets, net profits, and maintenance of 1000 companies for 1946 to 1948 inclusive; to show the effect of maintenance costs in companies of various sizes, 50 companies each were arranged in three groups (large, medium, and small) according to 1948 dollar volume of sales. The data show that the largest of these companies (7.73% net profits, 4.58% maintenance) spent an amount equal to 60% of the net profits. The medium companies (8.07% of net profits, 2.91% maintenance) earned larger net profits and exercised closer control over maintenance. The smallest companies (4.75% net sales, 3.13% maintenance) spent approximately two thirds of their net profits on maintenance. An analysis of 21 companies manufacturing pulp, paper, and board products (in addition to other industries which were investigated) showed that maintenance costs take 6.02% of each dollar of net sales and an expenditure of 12.46% of net property. In the paper-converting industry, these figures are 2.91 and 12.02%, respectively. A study of other factors

relative to the companies examined in this investigation showed that 1949 profits were dropping 30-40% and, unless there was a similar drop in maintenance costs, the latter would exceed net profits in the majority of companies. 3 charts. E.S.

MOLECULAR WEIGHT

SCHULZ, G. V. An abbreviated fractionation method for the determination of molecular-weight distributions. Makromol. Chem. 5, no. 1: 83-94 (June, 1950). [In German; English summary]

An approximate molecular-weight distribution curve for a polymeric substance may be obtained from the following experimental data: (1) the average D.P. of the whole polymer (such as by osmotic pressure); (2) the average D.P. of the lowest and of the highest fractions obtained from the whole polymer; and (3) the weight percentage of the whole polymer represented by each of the two fractions. The theoretical basis and experimental verification are presented. Systems having both broad and narrow distributions are treated. These include polystyrene, cellulose nitrate, and fractionated cellulose nitrate. 2 tables, 7 figures, and 13 footnotes. J.O.T.

PACKAGING

ANON. Candy. Modern Packaging 23, no. 12: 67-72, 162 (August, 1950).

The candy industry expects to achieve record sales volumes this year, chiefly as a result of improved packaging. Since candy is primarily an impulse item, its sale depends upon eye-catching designs and packaging techniques. Some of the novelty boxes, bars, and other package forms produced by the various candy companies are described and illustrated. 24 illustrations. J.A.B.

ANON. Packaging to make shopper stop! look! and buy! Packaging Parade 18, no. 211: 44-5, 53 (August, 1950).

A recent national survey conducted by the Du Pont Company revealed that impulse buying accounts for two out of three purchases made in super markets. Statistical results of the survey are tabulated. 1 table and 5 illustrations. J.A.B.

BRESKIN, CHARLES A. Recent developments in American packaging. J. Inst. Packaging no. 7: 25-9 (Winter, 1949-1950).

The importance of packaging in stimulating and facilitating international trade is pointed out. Some of the packaging innovations in the U. S. are mentioned, such as prepackaging, frozen food packaging, collapsible tubes, plastic films, polyethylene squeeze bottles, etc. European manufacturers are advised to improve their packaging techniques, with special regard to protection, convenience, economy, and merchandising appeal, in order to earn the favor of American consumers. 3 illustrations. J.A.B.

PAPER—COATED

AITKEN, EDWARD A. High gloss paper. Printing Mag. 74, no. 5: 51 (May, 1950); Share Your Knowledge Rev. 31, no. 9: 15-16 (July, 1950).

Directions for the printing of Kromekote, Waretone, and Mirrorcoat (three very highly finished coated papers) are given. The finish and uniformity on all three sheets are very much improved, and the printing problems are minimized to a degree that most pressmen would rather print on them than on a No. 1 grade coated paper. Transparent colors are an absolute

necessity, and opaque or solid colors should never be used. When the job is printed on both sides, the glazed side should always receive the first impression. The trapping of gloss inks is excellent; only a very slight offset spray is recommended. No racking is required and the sheets can be piled or stacked without any stick in the pile. E.S.

ANON. Production of coated offset paper. Am. Pressman 60, no. 6: 47-8 (May, 1950); Share Your Knowledge Rev. 31, no. 9: 31-3 (July, 1950).

In changing from uncoated offset paper to coated stock in the case of 60- to 70-pound weights in general magazine use, many pressmen and production executives found that production dropped from 10 to 30%. Some of the reasons are discussed. A coated offset sheet is thin and somewhat flimsy in comparison with an uncoated offset sheet of the same weight. Coated offset papers are inclined to curl, buckle, or wave excessively; they stick together when excess moisture comes in contact with the sheet. In addition, parts of the coating seem to form a scale on the blanket which must be cleaned more often than usual. Frequently spray guns are required; their use on one side often results in the accumulation of spray particles on both blanket and rollers, necessitating additional cleaning. E.S.

CURRAN, M. J. Paper conversion. J. Inst. Packaging no. 5: 27-9 (Spring, 1949).

New developments in the paper conversion industry are divided for the purpose of discussion into the following groups: lacquer coatings, emulsion coatings, hot-melt coatings, plastisols and organisols, vapor coatings, and polymer-monomer coatings. The materials used and the advantages and disadvantages of each are considered. Brief mention is made of sealing methods and developments in printing processes. J.A.B.

ZONNER, WILLIAM A. Some economic aspects of machine-coating. Pulp & Paper 24, no. 9: 48 (August, 1950); Paper Ind. 32, no. 6: 658-9 (September, 1950).

Following a brief review of the development of machine coating, the author discusses recent trends and problems, notably in groundwood-base papers. The demand for wider trims cannot always be met by the older machines; various companies have installed small supercalenders and have thereby defeated the purpose of their wider coating machines. The correct type of furnish with a good mechanical performance on the machine is very important to prevent paper breaks; automatic stopping devices should be applied to eliminate all possible wrap-ups which are very injurious to rubber rolls. The use of as many chromium rolls as possible will be found advantageous, as well as the installation of well-synchronized drives. E.S.

PAPER AND PULP INDUSTRY

ANON. American market pulp; its influence upon the pulp market. Papeterie 72, no. 7: 345-7, 349, 351, 353-5 (July, 1950). [In French]

The author discusses the shifting trends in the market pulp of the world, the enormous consumption in the United States, and the repercussions on the European pulp market. Numerous statistical tables. E.S.

CLAUSON, KARL A. Market pulp trends in the United States. Can. Pulp Paper Ind. 3, no. 8: 8, 10, 12 (August, 1950); *cf.* B.I.P.C. 20: 577.

The author discusses the impact of the two basic, long-term trends in the American paper economy on the nonintegrated mills: their own changing position in the economy, and the changing pattern of the raw-material supply. In addition to the changing source of market pulp (which has shifted from Europe to Canada), three important long-term trends in the demand for individual grades of market pulp manifest themselves: the growing demand for sulfate pulp, the growing demand for bleached pulp, and the declining demand for sulfite pulp (which is probably more a lack of growth than an actual decline in tonnage). The most discouraging element in the supply picture, from the point of view of the pulp consumer, is the lack of growth in the total available supply of market pulp. There has been virtually no increase in total supply during the past 10 years despite the addition of several new market pulp mills. 2 diagrams. E.S.

KELLEHER, DENIS. Papermaking in Ireland. Paper Maker [U. S.] 19, no. 2: 21-9 (September, 1950).

The history of papermaking in Ireland is told in some detail. While under direct British rule, every attempt at papermaking, or any other industry in Ireland, was stopped by means of direct legislation or by legal attrition. The new native government, bent on the revival of industry, imposed a 50% ad valorem tariff on imported stationery, and since the last war, exactly half of the paper requirements have been supplied by home mills. The government has also begun a reforestation program. This trend toward industrialization may have to be altered if, as some experts believe, with the economic integration of continents, Ireland's role should be that of a vegetable garden for Europe. Some statistics are given concerning paper production, imports, and exports for the past two years, and notable Irish paper mills are listed. 4 tables, 15 illustrations (including 3 inserted leaves), and 18 references. J.A.B.

RITCHIE, JAMES L., and BETTENDORF, HARRY J. Wood pulp and pulpwood statistics. Fibre Containers 35, no. 8: 124-32 (August, 1950); *cf.* B.I.P.C. 20: 100.

The wood-pulp productive capacity during the postwar period increased at a rate of approximately one million tons a year, so that it totals over 16 million tons a year in 1950. Domestic pulp production increased steadily during the first three postwar years to a peak level of 12,872,292 tons in 1948; production declined by 6% in 1949 to a level of 12,156,987 tons. Production during the first months of 1950 has been higher than the record rate of 1948. Imports of wood pulp reached a postwar peak in 1947 with 2,322,460 tons, which declined to 2,176,111 in 1948, and to 1,764,052 in 1949. Imports of market pulp in 1949 totaled 1,303,156 tons, 74% of the total imports, which was made up of 49% bleached chemical pulp, 41% unbleached chemical pulp, and 10% groundwood. Canada supplied 65% and Europe 35%; in 1937, the figures were 23 and 77%, respectively. Receipts of pulpwood at U. S. mills reached an all-time high of 22,332,680 cords in 1948, but were 14% less (19,244,743 cords) in 1949; pulpwood consumption in 1949 totaled 19,918,766 cords, as compared with 21,189,458 cords in the record year of 1948. Numerous tables, diagrams, and pie charts. E.S.

SAHLIN, E. G. The growth of the Swedish paper industry from 1920 to 1950. Svensk Papperstidn. 53, no. 11: 279-86; no. 13: 349-55 (June 15, July 15, 1950); World's Paper Trade Rev. 134, no. 4: 235-6, 238, 240, 282; no. 8: 515-16, 518, 520, 556, 558 (July 27, Aug. 24, 1950); Paper-Maker (London) 120, no. 3:

185-6, 188-9 (September, 1950). [In Swedish; abbreviated English translation]

This is a historical, statistical study (going back as far as Sweden's first paper machine which was imported from England and erected at Klippan in 1832) and is supplemented by many data in tabular form. The author discusses the increase in the number of paper machines; the number of mills and machines; paper machines of Swedish and foreign origin; the production, domestic consumption, imports, and exports of machine clothing; productivity in Sweden as compared with England, Denmark, and Norway; the increase in Swedish paper manufacture; capital investment; capital required for a modern mill; the width and speed of paper machines; expansion in the foreign, chiefly American, newsprint industry; and possible future trends in Sweden. 31 tables. E.S.

PAPER AND PULP INDUSTRY—LAWS AND LEGISLATION

PARKER, LEO T. Legal decisions can help shape management policies. Paper Ind. 32, no. 5: 504-6 (August, 1950).

Recent higher-court decisions involving the pulp and paper industry are reviewed, including the ownership of patents, unemployment and total-incapacity compensation cases, the liability of a company for negligent drivers or independent contractors, the use of similar names, the recovery of income-tax overpayments, and the right of a seller to recover his merchandise from a bankrupt or insolvent purchaser. E.S.

PAPER AND PULP INDUSTRY—MUSEUMS

WHEELWRIGHT, WILLIAM BOND. The world's greatest museum of paper. Paper Maker [U. S.] 19, no. 2: 11-18 (September, 1950).

The Massachusetts Institute of Technology has appropriately relocated the Dard Hunter Paper Museum in the new two-million dollar Charles Hayden Memorial Library in Cambridge, Mass. The museum is illustrated, and some of the articles of particular interest are pointed out. An interesting biographical sketch of Dard Hunter is given, and a bibliography of his publications on papermaking, eight of which have been produced on his own presses and own handmade paper, is appended. His latest book, "Papermaking by hand in America", will be ready for distribution late in 1950. 7 illustrations. J.A.B.

PAPER AND PULP MILLS

ANON. Five years of modernization and restoration at Ocean Falls, B.C. Pulp Paper Mag. Can. 51, no. 8: 62-4 (July, 1950); *cf.* B.I.P.C. 19: 332.

A brief review of the rehabilitation and modernization program of Pacific Mills, Ltd. at Ocean Falls is given, covering the groundwood, kraft, sulfite, and paper mills, power plant, and townsite. 6 illustrations. E.S.

ANON. M & O bleach plant in complete operation at The Falls. Pulp & Paper 24, no. 9: 64, 66 (August, 1950); *cf.* B.I.P.C. 20: 471.

Reference is made to the completed kraft and sulfite pulp bleach plant at International Falls, Minn. and the new broke beater installed at Kenora, Ont. 4 illustrations. E.S.

ANON. New mill who's who; Prescott has sound backing. Pulp & Paper 24, no. 9: 32-3 (August, 1950).

Reference is made to the contemplated construction of a newsprint mill

on the Little Missouri River, near Prescott, Ark., by the newly formed and recently incorporated White Star Paper Co. The project is backed by the Diercks Lumber & Coal Co.; James R. Bemis, president of the Ozan Lumber Co. at Prescott, is also president of the White Star Paper Co. E.S.

ANON. New paper-making machine opened at Kankinara mill. Indian Print & Paper 15, no. 63: 34-7 + 1 plate (April, 1950); Indian Pulp and Paper 4, no. 11: 448, 459 (May, 1950).

The Titaghur Paper Mills Co., Ltd. installed a new paper machine in the place of an old one in its Kankinara mill in Bengal, the first new Indian machine since the last war. It was supplied by James Bertram & Son Ltd. of Edinburgh, Scotland; it has a wire 117 inches wide and is equipped with a Harland sectional electric drive. At first, the usual qualities of Titaghur fine papers will be produced; however, the machine is also designed for manufacturing machine-coated art paper, and its production will be undertaken at a later date. A new third turbo-generator manufactured by British Thomson-Houston Co. has also been installed in the power plant. Brief reference is made to the dedication ceremonies of the two new units in January, 1950. 11 photographs in the first reference. E.S.

PORTER, RICHARD W. Calcasieu Paper Co. shuts down old mill —starts up new. Paper Ind. 32, no. 5: 494-500 (August, 1950); *cf.* B.I.P.C. 20: 883.

An illustrated description is given; see following references. 23 illustrations of the equipment. E.S.

PULP & PAPER. Louisiana expansion; Calcasieu Co.'s new plant. Pulp & Paper 24, no. 9: 52-3, 55, 60, 62, 90 (August, 1950); see abstracts above and below.

An illustrated description is given. E.S.

WATERS, VINCENT F. Calcasieu Paper Company—a story of management enterprise and engineering achievement. Southern Pulp Paper Manuf. 13, no. 8: 26-8, 30, 34, 36, 38-40, 42-3 (August, 1950); *cf.* B.I.P.C. 20: 883.

A profusely illustrated description of the new pulp and paper mills at Elizabeth, La., is given, including personnel, installations, and principal suppliers of new equipment. The new mills with a new 160-inch Pusey and Jones Fourdrinier paper machine are replacing old mill buildings of wooden construction and a Beloit Fourdrinier 108-inch paper machine; a new power plant was also erected. The change-over required about two years of excavation, construction, and installation of machinery and equipment. The new mills produce about 200 tons of kraft paper per day, part of which is converted in a new modern bag plant at the mill site with a daily capacity of 3,500,000 bags; in addition, kraft wrapping paper, butchers wrap, and special papers are made. E.S.

PAPER MANUFACTURE

ANON. Do you know how paper is made? Papetier 4, no. 7: 47, 49, 51; no. 8: 25, 27, 29-30 (July, August, 1950). [In French]

A brief outline of the raw materials, processes, and machinery employed in papermaking is given. In conclusion, reference is made to trade practices based on standards developed by AFNOR (Association Française de Normalisation), the French bureau of standards. E.S.

PAPER SIZING

BALKIN, P. The virtues of tub-sizing. Paper Market: 155 (June, 1950).

The advantages of tub sizing are emphasized, such as freedom from loose fibers on the surface, improved erasing properties, added resilience and durability, and improved folding properties. These are useful features in certain high-grade papers (ledger and similar papers) which may be subject to constant reference and must withstand a fair amount of handling, so that their higher price is justified. Simple tests for size resistance are mentioned. E.S.

PAPER SPECIALTIES

ANON. Gummed paper and its applications. Papetier 4, no. 6: 23, 25 (June, 1950). [In French]

The three most common gumming agents (gum arabic, dextrin, and gelatin), the coating of the base paper, and some of the numerous applications of gummed paper (different types of labels and tapes, stamps, teletype paper, etc.) are described. E.S.

ANON. Wood impregnation by osmosis; the role of waterproof paper and its application to pulpwoods. Papeterie 72, no. 7: 371-3, 375, 377 (July, 1950). [In French]

Following a brief review of the common chemicals used as wood preservatives and a short description of the impregnation process by osmosis, reference is made to the need for a cheap, pliable, waterproof paper for covering the barked and treated logs, which will be strong enough to resist the influences of the weather for several months. 14 footnotes. E.S.

BORDEN, GEORGE C., JR., and WOLPER, PAUL K. The what and how of glassine. Modern Packaging 23, no. 12: 111-17, 169 (August, 1950).

The basic properties of glassine are listed, and the steps in its manufacture which impart these qualities are explained. Emphasis is placed on three important points: the use of chemical wood pulps; a high degree of hydration to impart greaseproofness; and densification, which makes the greaseproof paper into glassine. Graphs and photomicrographs illustrate the effect these steps have upon the pulp. The basic protective characteristics of glassine may be enhanced or modified by converting operations, principally coating and laminating; the properties and applications of these allied materials are also mentioned. 3 tables and 4 figures. J.A.B.

CLARK, ROBERT C. War leaders hail use of rust inhibiting papers for packaging. Paper & Paper Products 91, no. 23: 1, 7 (Aug. 20, 1950).

The advantages of rust-preventive inhibitor papers for packaging weapons or printing presses are emphasized; the length of the period of protection offered by these papers will depend upon the seriousness of moisture conditions encountered. The names of the four competing manufacturers are listed, each of whom uses a different inhibitor formula. E.S.

RAUTH, A. The aging of the dielectrics in impregnated paper. Électricien (Paris) 61: 143-7 (1948); C.A. 43, no. 11: 4464 (June 10, 1949). [Original in French; abstract in English]

The losses in paper-insulated cables are caused almost exclusively by the

formation of bubbles of dissolved gases in the impregnating oil in which, under the influence of the electrical field, electric discharges take place which ionize and disintegrate the oil; the presence of oxygen enhances its decomposition. Therefore impregnating oils should be carefully degassed. Impregnated paper ages, independently of high electric stresses, more rapidly, the more active is the internal evaporation of the moisture and of the components of the oil; the previous treatment of both paper and oil is therefore a determining factor in the life of the paper insulation. E.S.

SMITH, W. J., and STAFFORD, EARL. New dust filters giving unequalled results. Chem. Eng. 57, no. 8: 105 (August, 1950); *cf.* B.I.P.C. 20: 656.

Additional information on the asbestos-paper dust filters of extraordinary efficiency is given; originally developed for Army use, they will be available to industry. For testing the performance of a filter, a high-speed impactor is used. A portion of the air to be tested is driven at sonic velocity through a small jet, whereupon particles of suspended matter are impacted upon a prepared glass slide for direct count under a high-power microscope. A good filter paper will clean air so thoroughly that the impactor may have to run many hours before enough particles are deposited to be seen under the microscope. If operating on dry dust, the filtering performance improves during use; the life of the papers will depend upon dust-load conditions. Paper filters protected by forefilters have given continuous service for more than a year and a half. On a cubic foot-capacity basis, they are more expensive to manufacture and operate than ordinary filter media; however, they perform an entirely different job: that of final air cleaning. 1 diagram. E.S.

PHYSICAL TESTING—INK

WALKER, W. C., and ZETTLEMOYER, A. C. Grindometer fundamentals. Am. Ink Maker 28, no. 7: 31-4, 55, 57 (July, 1950); *cf.* B.I.P.C. 20: 108.

The drawdown-type fineness-of-grind gages are coming into ever wider use for the evaluation of printing-ink texture. Therefore it is important that the fundamental principles involved be understood. Gages of this type are subject to sources of errors which affect their reproducibility. First, there are the errors arising from imperfect design and technique, which can be reduced by a careful study of the instrument. The reproducibility obtainable by such work, however, is limited by the presence of a second factor inherent in the randomness of the distribution of the large particles throughout the ink. A mathematical examination of this source of error is made, and a limiting curve for the optimum precision of such instruments is developed. This curve indicates that exceedingly high errors may be encountered by the unwary technician. The particles found by this method of measurement are from the coarse ends of the particle size-distribution curve for the ink under examination. Very little additional precision can be developed with this type of instrument. 4 tables, 5 figures, and 1 reference. E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

THE INSTITUTE OF PAPER CHEMISTRY. Testing methods for printability of newsprint. Progress Report Two. "The ink receptivity of newsprint," for American Newspaper Publishers Association. Am. Newspaper Publ. Assoc. Research Bull. 26: 51-76 (June 30, 1950).

This report (the first part of which was not published) describes a new

procedure for applying a film of ink to a paper surface and for analyzing the results. It appears that the method may be useful for studying the ink receptivity of newsprint. A drop of ink is rapidly spread over the paper surface by a rolling cylinder. The resulting ink pattern on a paper is elliptical, or "egg" shaped. The area of the ink pattern is measured. The difference in the weights of the paper specimen before and after application of the ink is the weight of ink spread over the paper. The difference between the original weight of the ink drop and the weight of ink on the paper is the weight of the ink film retained on the roll surface. Thus, the "splitting" of ink between the roll and the paper surface is known. The average thickness of the ink film on the paper is calculated from the amount of ink on the paper and the area of the pattern. This spreading procedure and method of analysis have been used to study ink films on three samples of newsprint, blotter paper, aluminum foil, cellophane, Pliofilm, and glass. A single news ink was used. Ink drops of constant size were spread on all the surfaces with a wide range of roll speeds. The ink spread in the same fashion on all the smooth nonreceptive surfaces—i.e., the thicknesses and areas of the ink films were the same for foil, cellophane, Pliofilm, and glass. The area and thickness of the ink film changed with the roll speed; the films were thicker and covered a smaller area at the higher speeds. The splitting of the ink between roll and test surface was independent of roll speed and 50% of the ink remained on each surface. The thicknesses and areas of the ink films varied among the different papers. The films on paper were all considerably smaller in area than the films formed at the same speed on the smooth nonreceptive surfaces. The splitting of the ink between the roll and the paper surface varied among the papers and changed with the roll speed. It is apparent that the area and thickness of the ink film depend on the roughness and ink receptivity of the surface. The ink will not spread over as great an area on a rough surface as on a smoother surface of the same receptivity. Likewise, the area of spreading will be less on a receptive surface than on one of lower receptivity and the same roughness or smoothness. It is not yet possible to distinguish between the effects of roughness and receptivity. It is hoped that additional work will lead to such differentiation of these two surface properties through analysis of the changes in ink spreading behavior with roll speed. At low speeds, receptivity should be more important in determining the area and thickness of the ink film than at high speeds. 8 tables, 7 figures, and 2 references. E.S.

PHYSICAL TESTING—PAPER—SOFTNESS

LYNE, L. MURRAY. The mechanism of softness in paper. Pulp Paper Mag. Can. 51, no. 8: 80-2 (July, 1950).

The four principal physical properties which contribute to the softness of paper or any other material are: density, rigidity, compressibility or resilience, and surface smoothness, which are interrelated and, in turn, are dependent on the basic structure of the paper. In any paper there exists a limited variety of fibers of various lengths mechanically intermeshed and held together by physico-chemical fiber-to-fiber bonds. The physical properties of this paper are, therefore, totally dependent on the following factors: the degree of mechanical entanglement of the fibers, the number of fiber-to-fiber bonds per unit volume, the total area of these bonds, the strength and flexibility of these fiber-to-fiber bonds, and the physical characteristics of the fibers themselves, such as their average length, flexibility, strength, and density. The author discusses the effect of these various factors on the paper structure, with special reference to their effect on density, rigidity, compressibility, and surface roughness, and the means which the papermaker has at his disposal for influencing them to give the subjective feeling of softness. In conclusion, brief reference is made to the testing equipment available

for the evaluation of softness, including the merits and limitations of the various instruments, the Clark tester in particular, and procedures. 1 diagram. E.S.

PHYSICAL TESTING—PAPER—VAPOR TRANSMISSION

WINK, W. A., and VAN DEN AKKER, J. A. Instrumentation studies. LVI. Penetration of paper by water vapor. Part VIII. Development of a method for the measurement of water-vapor permeability at low temperatures. Tappi 33, no. 8: 84-96A (August, 1950); *cf.* B.I.P.C. 17: 192-3.

The authors describe the development of a method for the measurement of water-vapor permeability at low temperatures in which the application of the dynamic method has been investigated. The dynamic method was developed in an earlier instrumentation study for the measurement of permeabilities at normal room temperatures and was described in Instrumentation Studies LII (*cf.* B.I.P.C. 16: 244) and LIII (*cf.* B.I.P.C. 16: 297-8). Studies which are pertinent to the field of permeability measurements at low temperatures and which are described in this report include: (1) the development of a cryostat for the control of temperatures and relative humidities; (2) an investigation of the performance of the electric hygrometer at low temperatures; (3) the design and development of the permeability testing apparatus applicable to low-temperature work; (4) the evaluation of equilibrium relative humidities over saturated salt solutions; (5) the development of an indirect method for obtaining the moisture-absorptive capacity of the electric hygrometer at both normal room and subfreezing temperatures; and (6) the development and performance of a small electric hygrometer, in which the moisture-absorptive capacity is appreciably reduced. Following the successful development of a small electric hygrometer having a low moisture-absorptive capacity, permeability measurements were made by the dynamic method at a reduced temperature employing samples of Pliofilm and Polythene. The permeability measurements on these two samples have shown that the dynamic test is a rapid method of evaluating the water-vapor permeability of moistureproof materials having a low moisture-absorptive capacity. 2 tables, 20 figures, and 3 references. E.S.

PHYSICAL TESTING—PAPER—WET STRENGTH

SCHRÖTER, HELMUT. Wet strength of pulp sheets. II. Secondary wet strength. Das Papier 4, no. 13/14: 278-85 (July, 1950). [In German] *cf.* B.I.P.C. 20: 195.

In contrast to the initial wet strength of a pulp web, the secondary wet strength (I) (resulting from the rewetting of a dried pulp sheet) is influenced very little by the characteristics or treatment of the pulp. The lower the moisture content in groundwood, the greater is the breaking length. The time of immersion of the sheet has practically no effect on (I), when the wet sheet is pressed subsequently to a specific water content. The breaking load and breaking length of a dried chemical pulp sheet increased with increasing weight/unit volume, the greatest increase being manifested by sheets with highest weight/unit area. The breaking load and breaking length of dry chemical pulp sheets decreased sharply with increasing thickness. The breaking load increased and the breaking length decreased with increasing weight/unit area. At a constant dry weight of 25%, changes in weight/unit volume or in the thickness of the chemical pulp sheets had no effect on the (I). Breaking length, breaking load, weight/unit volume, and capillary rise *vs.* degree of beating are discussed, especially in the case of an alkaline purified sulfite pulp (Zemofaserstoff) (II). (I) is unaffected by increased degree of beating (S.-R.), but both the initial wet and dry strengths show a

rise in breaking length and breaking load with higher beating degrees. The capillary rise in millimeters per 10 minutes drops with beating to 28° S.-R. in the case of (II). In sulfite pulps, differences in fiber length have a marked effect on the dry breaking length and breaking load, both of which increased with decreasing fiber length. The initial wet strength was also affected, but was highest with pulp of intermediate fiber length. (I), however, was almost unaffected by differences in fiber length. The practical significance of these findings [i.e., that (I) cannot be influenced by any kind of prior pulp treatment, apart from chemical impregnation] is discussed. 9 graphs. L.E.W.

PHYSICAL TESTING—PULP—SURFACE AREA

BROWNING, B. L. The specific surface of pulps by the silvering method; discussion of The Institute of Paper Chemistry method of procedure. Tappi 33, no. 8: 410-12 (August, 1950); Pulp Paper Mag. Can. 51, no. 9: 116-18 (August, 1950); *cf.* B.I.P.C. 12: 397-8; 20: 488.

The author describes the latest modifications of the silvering technique for determining the specific surface area of pulp fibers, which represents the procedure now in use at The Institute of Paper Chemistry. 1 table and 9 references. E.S.

MASON, S. G. The specific surface of fibers—its measurement and application. Tappi 33, no. 8: 403-9 (August, 1950); Pulp Paper Mag. Can. 51, no. 9: 109-15 (August, 1950).

The specific external surface area of pulp fibers is a fundamental property of considerable importance. Of the various methods of measurement applicable to particulate systems in general, only the microscopic, the Clark silvering, the optical, and the fluid-permeability methods have been used with any success on pulp fibers. The last three methods are reviewed and, to illustrate the application of each, representative results obtained by various workers are presented; particular emphasis is placed on the permeability method. 5 tables, 6 figures, and 23 references. E.S.

PHYSICAL TESTING—WOOD

PFALZNER, P. M. On the flow of gases and water vapor through wood. Can. J. Research 28 A, no. 4: 389-410 (July, 1950).

The quantities of water vapor passing through wood have been measured under the conditions of hydrodynamic flow and of kinetic diffusion. Air and oxygen pass through wood under hydrodynamic flow conditions in accordance with the Knudsen-Poiseuille law. Water vapor passes through wood under hydrodynamic flow conditions in much larger quantities than those predicted by the law. The rate of passage of water vapor under diffusion conditions follows the Fick diffusion law, but with a diffusion coefficient which increases with relative humidity. The distinct features of the diffusion and hydrodynamic flow processes are pointed out. Porous, hygroscopic media permit the transfer of water vapor by diffusion only, regardless of the external conditions. 7 tables, 5 figures, and 17 references. J.A.B.

PLASTICS

ANON. Polyethylene progress. Chem. Inds. 67, no. 2: 177-8 (August, 1950).

Because of its unique combination of physical properties and the low cost of raw materials, polyethylene is expected to become the most important of

all plastics, and its production has already reached 75 million pounds per year. Some of the new uses found for this versatile plastic are mentioned. 2 illustrations. J.A.B.

PLASTICS—TESTING

ARNST, ALBERT. Multiple forest harvests feed digesters. Paper Trade J. 131, no. 7: 34, 36, 38, 40, 42, 44 (Aug. 17, 1950).

The most significant postwar utilization advancement made by Weyerhaeuser Timber Co. is the complete integration of sulfate mills at the Longview and Springfield locations, with sawmilling and other wood-processing facilities on the same plant sites. As a result, large volumes of milling by-products and small logs which are otherwise unsuitable for lumber production because of size and shape now find an economic outlet. One of the outstanding characteristics of salvage logging is the mechanization of nearly all phases, from tree falling to log dumping. The mechanical details are given for a typical logging operation. 20 illustrations. J.A.B.

REINHART, FRANK W., and WILLIAMS, HARRY C., JR. Resistance of representative plastic materials to hydrofluoric acid. ASTM Bull. no. 167: 60-2 (July, 1950).

The results of a seven-day continuous and a 48-day discontinuous immersion test of various plastic materials in 48% hydrofluoric acid at 20-30° C. are given. They indicate that urea-formaldehyde and cellulose acetate plastics are soluble at room temperature. The phenolic laminate plastics containing cellulosic fillers were appreciably affected in less than a week; the one filled with asbestos was affected more than those filled with cellulosic materials. The melamine plastics were markedly affected. The resistance of the glass-fabric polyester plastic was less than that of the cellulose-filled phenolic plastic. The behavior of the polymethyl methacrylate was peculiar; it became swollen, rubbery, and milky, and was still swollen and milky, although no longer rubbery six months after removal from the acid solution. The resistance of polystyrene was outstanding. Polyethylene and vinyl chloride-acetate plastics were affected only slightly, although more so than polystyrene. 4 tables and 1 figure. E.S.

WANDEBERG, E., and EHLERS, G. Laminated paper-base and fabric-base plastic products. Kunststoffe 40, no. 4: 139-41 (April, 1950). [In German]

The text of the German tentative standard DIN 7735 is presented; data on composition, and mechanical, electrical, and other properties are included in tabular form. E.S.

PRINTING AND PRINTER'S INK

ALLYN, GEROULD. Synthetic resins. Am. Ink Maker 28, no. 8: 33-5, 57, 59 (August, 1950).

The author discusses the synthetic resins which are of commercial importance to the ink industry, their applications, and their methods of film formation. 1 illustration. E.S.

ANON. Printers' paper problems. XII. A need for standards of substance. Indian Print & Paper 15, no. 63: 49 (April, 1950); *cf.* B.I.P.C. 20: 659-60.

The author discusses the need for the general adoption of the 500-sheet ream count and 100-sheet board packages, which have been agreed to in principle, but which are not yet actually used by all papermakers, merchants,

and printers. The additional need for standards in substance (basic weight) for all writing and printing papers and paper boards is emphasized, and a surface area of 500 sq. in. (royal crown) is suggested as the basic standard. E.S.

BOUGHTON, FRANK E. Aniline or rotogravure for the paper converter? Am. Paper Converter 24, no. 8: 9, 44-5 (August, 1950); Am. Boxmaker 39, no. 8: 12, 14 (August, 1950).

The two types of printing are compared, and the advantages and limitations of each are outlined. Rotogravure gives a better quality of printing on a larger variety of work; the cost of ink coverage is less, except where water inks are run on an aniline press; there is less make-ready; and if the runs are long enough to amortize the cost of the cylinder, the process can be cheaper than aniline. Aniline registers sufficiently close for the average job, the original investment in equipment is less, and the initial cost of printing plates is much less than rotogravure. 2 illustrations in the second reference. J.A.B.

ARTHUR D. LITTLE, INC. Report on the application of new mechanical techniques to newspaper production problems to American Newspaper Publishers Association. Am. Newspaper Publ. Assoc. Research Bull. 27: 78-116 (July 11, 1950).

This is a summary of a study of the present methods of newspaper printing with suggestions for possible improvements in paper, composing room, pressroom, mailroom, photoengraving, color separation machines, and packless mats. Where the circulation is fairly large, the largest cost item is paper. Suggested methods for cutting paper costs include: automatic inspection and marking blemishes at the mill; the use of recording accelerometers to trace causes of damage in transit; the use of models in studying the reorganization of paper handling and storage; and new methods of web-tension control in the press room to reduce web breaks. 14 figures. E.S.

LONG, ROBERT P. Paper selection. Modern Lithography 18, no. 8: 34-5, 95 (August, 1950).

The results are given of a survey of a cross section of the lithographic industry to determine who selects the papers used. The over-all averages for all types of papers showed that 75.4% are selected by the lithographer, 15.1% are chosen by the customer from samples submitted by the lithographer, and 9.5% are specified by the customer. These figures are also broken down for regular offset, coated offset, bond and ledger, and label papers. 2 tables. J.A.B.

MILES, WILLIAM J., and THOME, JOHN S. Classification of dyes for aniline inks. Am. Ink Maker 28, no. 8: 31-2, 55, 57 (August, 1950).

Following a brief history of the development of aniline printing, the dyes commonly used in the inks are listed according to their chemical structure. Examples are given to illustrate how, by small substitutions in these structures, the shade and physical properties of the dyes may be altered; innumerable combinations are possible. E.S.

PRITCHARD, HOWARD A. Print length and cylinder packing on offset presses. Graphic Arts Monthly 22, no. 8: 130, 132, 136, 138, 140, 142, 152 (August, 1950); Modern Lithography 18, no.

8: 41-3 (August, 1950); Am. Paper Converter 24, no. 8: 10-11, 46-7 (August, 1950).

Most offset pressmen are aware of the fact that the amount of packing used under the plate and blanket has a direct bearing upon the length of the image which appears on the printed sheet. In addition, a number of other factors exert an influence, such as the snap-back and the curvature of the paper, moisture (probably the most familiar factor), the pull-off from the blanket, the pressure of the cylinders, the thickness of the paper, and the curvature of the plate. Most of these factors tend to lengthen the print, and most of them vary from one kind of paper to another; all of them are difficult to measure. When the exact print length is not required, it is recommended that the plate be packed even with its bearers. The print length may be changed by changing the packing of the plate or the diameter of the impression cylinder. To lengthen the print, either the packing under the plate should be decreased or the diameter of the impression cylinder increased. To shorten the print, the opposite should be done. In all cases only enough blanket packing should be used to obtain a good image transfer from the plate; the blanket packing does not determine the length of the print. For the best printing quality, regardless of the plate packing required by the job, the minimum impression-cylinder pressure, the minimum blanket packing, and the minimum ink and water should be used. 4 diagrams and 1 reference.

E.S.

TOLLENAAR, D. Paper structure. Chem. Weekblad 44: 753-7 (1948); C.A. 43, no. 11: 4464 (June 10, 1949). [In Dutch; abstract in English; abstract only available] *cf.* B.I.P.C. 19: 489.

From the standpoint of ease of penetration and drying of ink, newsprint should have a great number of capillaries of markedly different sizes: the large ones for quick absorption and the smaller ones for slower but extensive diffusion of the ink. This condition is satisfied when the frequency curve of the capillary dimensions is very flat; if this is not possible, the curve should have more than one maximum. The desired structural variations may be had in a paper of long fibers between which fine particles are distributed.

E.S.

TOLLENAAR, D., and BLOKHUIS, G. The structure of paper. Applied Sci. Research A2, no. 2: 125-41 (1950); Printing Abstracts 5, no. 5: 211-12 (May, 1950). [Abstract only available] *cf.* B.I.P.C. 19: 489.

The flow of liquid in porous materials can be described by means of two constants: the mean pore radius r and the pore density N. To determine these two constants, two mutually independent equations are needed, such as the equation of Lucas-Washburn for the height of rise, that of Poiseuille for the rate of flow, that for the capillary volume, etc. This structural description, however, is inadequate (*a*) to explain the strike-through; (*b*) to explain the height of rise when the capillary pressure and the hydrostatic pressure are in equilibrium; and (*c*) to calculate the weight of the liquid risen. A new structure description with more constants, assuming a size distribution of the pore radii, presents the possibility of overcoming these difficulties. The distribution according to Gauss involves three constants: the most frequent pore radius r_0, a density factor n_0, and a factor x, which determines the standard deviation of r_0. The strike-through is explained by the difference in capillary pressure between narrow and wide capillaries, as a result of which the liquid present in the wide pores is forced into the narrow ones. For rotary printing it is desirable to use a paper with a flat distribution curve.

E.S.

PULP—ABSORBENCY

WURZ, OTTO. Absorptivity of paper halfstuffs. Das Papier 4, no. 13/14: 273-8 (July, 1950). [In German]

The author reviews the scant technical literature dealing with the absorptivity of pulps and papers and discusses capillarity, improved absorptivity of special papers, such as blotting papers, by the addition of asbestine (calcium-magnesium-aluminum silicate), and the movement of liquids in the living plant and in the paper sheet. Sapwood shows a greater capillary rise than does heartwood; however, it should not be inferred that pulps from sapwood yield a better material for the manufacture of absorptive papers than heartwood. Apparently a direct correlation exists between Schwalbe's hydrolysis difference (*cf.* B.I.P.C. 16: 470) and capillary rise in various pulps, 10 of which are listed. To obtain high absorptivity (only sulfite pulps are considered), the pulps should be prepared from slow-grown, uniform wood with thick-walled tracheids, freed as far as possible from the finest fiber fraction (mucilage), resins, and fats. Multistage bleaching enhances capillary rise, which increases markedly at every step. The factors influencing the manufacture of absorptive papers are described briefly, such as short, free beating, no addition of size or alum, and no hard pressing on the machine, so that the surface of the paper is not too smooth. 4 tables, 4 figures, and 7 references. L.E.W.

PULP WASHING

RICH, J. P. Dewatering and washing of pulps. Pulp and Paper Manual of Canada 17: 9-17, 19, 21, 55 (1949).

Following a brief description of various methods for washing different types of pulp (drainers, beater washers, pans, diffusers, drum washers, open-cylinder thickeners, and vacuum washers), the theory of washing is discussed, and calculations pertaining to washing are presented. In conclusion, a partial check list of factors is given which should receive consideration when washer performance and efficiency are not satisfactory (presence of air; uniformity of pulp supply; temperature; presence of a good-sized pond between water and air in the seal tank of the barometric leg; size of the wire mesh; a variable-speed drive to compensate for changes in freeness, temperature, and quantities of pulp to be handled; improper mixing of stock and dilution ahead of washer; inlet boxes which insure uniform distribution; underfeed supply pipes to all washers; and independent supports for the barometric legs). 3 tables and 11 figures. E.S.

RESEARCH

FOGH, IVAR. Research in logging mechanization. Pulp and Paper Manual of Canada 17: 99-100, 103 (1949).

The most fruitful and obvious field for research in logging mechanization is the study of equipment suitable for definite tasks. The selection of the correct type of personnel and the training of efficient operators, as well as a systematic inquiry into the effects of the mechanized operations on the forest as a whole, present additional urgent topics which should not be neglected. E.S.

SOUTHERN RESEARCH INSTITUTE. Wood and paper. Quart. Bull. Southern Research Inst. 2, no. 3: 23-4 (Fall, 1949).

Some of the projects concerning wood and paper undertaken by the Institute in the past five years are: the development of a procedure for wood seasoning and preservation, sponsored by the Gulf, Mobile & Ohio Railroad; an investigation of a profitable means of utilizing wood waste by hydrolysis

in weak sulfuric acid, sponsored by Nickey Brothers, Memphis, and the Tennessee Coal, Iron, and Railroad Co.; the development of a fire-resistant file folder, sponsored by the Zac Smith Stationery Co., Birmingham, Ala.; and a small program on the utilization of *Lespedeza sericea* stalks as a raw material in papermaking. 2 illustrations. J.A.B.

RESEARCH LABORATORIES

PARKIN, J. H. Model studies at the hydraulic laboratory. Pulp and Paper Manual of Canada 17: 101, 103 (1949).

Reference is made to the hydraulic laboratory of the Mechanical Engineering Division of the National Research Council of Canada, dealing with problems involving water (river improvement, harbor development, the handling of logs in rivers, etc.). Examples of several cases are given, and the possibility of assistance to the Canadian pulp and paper industry in problems arising in woodlands operations is indicated. E.S.

STRAPP, R. K. The chemical pulping laboratory at the Pulp and Paper Research Institute of Canada. Pulp Paper Mag. Can. 51, no. 8: 68-9 (July, 1950).

A brief description of the three new stainless-steel digesters and accessories in the redesigned chemical pulping laboratory is given. Each digester has a capacity of 15 pounds of ovendry wood; about 8-10 cooks can be made per week if pulp tests are included in the program. Without such tests, 15 cooks per week can be produced. 2 diagrams. E.S.

ROOFING FELTS

OLIENSIS, G. L. Twenty to thirty years' weathering of asphalt shingles made with unfilled coatings. ASTM Bull. no. 165: 59-64; discussion: 64-6 (April, 1950); *cf.* B.I.P.C. 17: 333.

Laboratory and Weather-Ometer tests on asphalt coatings, such as are used in ready-prepared roofings, have consistently pointed to the greater probable durability of the filled than that of the unfilled types. The author showed in the previous reference for the first time that actual 10-year exposure tests on large panels of coating on saturated felt had failed to bear out this trend. Corroborative evidence is presented in the present article of a number of asphalt shingle roofs made with unfilled coating that have successfully weathered 20- to 30-year exposures and therefore justify a reconsideration of those roofing specifications which make the use of filled coatings mandatory. 2 tables and 6 figures. E.S.

SALESMEN AND SALESMANSHIP

ANON. Stop at tourist courts for more sales. Paper Sales 10, no. 8: 14-15 (August, 1950).

Mention is made of the many uses for paper products in tourist courts and the restaurants, coffee shops, bars, and service stations in connection with them, and the paper salesman is urged to take advantage of these prospects. The importance of sanitation during the polio season is mentioned as a possible sales point. 1 illustration. J.A.B.

MACDONALD, KENNETH D. Novelty papers sell printing. Am. Printer 131, no. 2: 35, 85 (August, 1950).

Reference is made to the possibilities which exist in selling printing with the aid of novelty papers; however, to realize these possibilities, the salesman

must familiarize himself with the different lines which are currently available. E.S.

PAPER SALES. Prepackaging—the "new look" in food merchandising. Part II. Produce prepackaging materials. Paper Sales 10, no. 8: 16-19, 35-8 (August, 1950); *cf.* B.I.P.C. 20: 812.

In order to take advantage of the trend toward the prepackaging of produce, the salesman should be well-informed about the materials used, sealing methods, prices, and sales possibilities. This information is presented in a series of 26 questions and answers. 8 illustrations. J.A.B.

SEMI-CHEMICAL PULPING PROCESS

ANON. Semichemical pulp. Pulp & Paper 24, no. 9: 35-6, 38 (August, 1950).

The development of high-yield, semichemical hardwood pulping in the United States is outlined; the pioneering mill was at Knoxville, Tenn., where a semichemical process for extracted chestnut chips (based on experiments by the Forest Products Laboratory in Madison) was installed in 1925. Today there are 19 mills in the United States producing semichemical pulps of one kind or another; their total semichemical tonnage is averaging 2115 tons per day. Neutral kraft, sulfite, and groundwood processes have been developed. In conclusion, reference is made to the new neutral sulfite process at Wisconsin Rapids (*cf.* B.I.P.C. 20: 812-13). 1 table and 1 graph. E.S.

BROWN, K. J., and MCGOVERN, J. N. Production of high-yield pulps from aspen by mild treatments with sodium hydroxide. Tappi 33, no. 8: 364-8 (August, 1950).

In experiments at the U. S. Forest Products Laboratory, aspen (*Populus tremuloides*) chips were given mild treatments with sodium hydroxide solutions at atmospheric pressure and then mechanically fiberized to produce pulps in the yield range of 82 to 95%. Treatments were made with caustic solutions in concentrations of 24 and 63 grams per liter. The treating time varied from 15 minutes to five hours and the temperature from 25 to 90° C. The optimum treating condition from the standpoints of the treating variables, pulp yield, and pulp strength was a two-hour treatment at 25° with a sodium hydroxide solution having a concentration of 24 grams per liter. Chemical consumption for this treatment was about 5.5% sodium hydroxide, based on the weight of the wood, and a pulp yield of about 91%. Pulp made under these conditions was converted into corrugating board that compared favorably with commercial hardwood semichemical corrugating board in strength properties. The effects of the individual treatment variables are discussed. 2 tables, 6 figures, and 3 references. E.S.

SHIPPING CONTAINERS

ANON. Corrugated citrus box. Modern Packaging 23, no. 12: 98-100 (August, 1950); *cf.* B.I.P.C. 20: 741.

Essentially the same information is presented as in the previous reference. 5 illustrations. J.A.B.

CALLAHAN, T. PAT. Paper containers. Chem. Inds. 67, no. 2: 201 (August, 1950).

The use of multiwall paper bags, fiber drums, and fiber boxes for the packaging of chemicals is discussed briefly. J.A.B.

CASTLE, A. J. Corrugated containers. J. Inst. Packaging no. 5: 18-23; discussion: 23-6 (Spring, 1949); *cf.* B.I.P.C. 20: 742-3.

A more extensive discussion is presented than in the previous reference, but most of the same information is included. J.A.B.

DENNY, J. L. Moisture and the package. J. Inst. Packaging no. 6: 6-10; discussion: 10-13 (Exhibition no., 1949).

Water in its various forms is the cause of innumerable troubles in packaging, such as warping of wood and cardboard, weakening of sealing tapes and adhesives, corrosion of metal parts, loosening of labels, deterioration of the contents, and molding. Means are suggested for dealing with the problems of water and water vapor in containers made of metal, glass, wood, flexible materials, paper, and board, and methods for improving adhesives and protecting metal parts from corrosion are described. Brief mention is made of methods for testing the water and water-vapor penetration and the dampening expansion of packaging materials. J.A.B.

STEVENSON, HUGH. Solid board containers. J. Inst. Packaging no. 6: 22-5 (Exhibition no., 1949).

The materials used in the manufacture of solid fiberboard cases are described, and the processes of lamination, printing, bending and slotting, stitching, and sealing are outlined. Mention is made of the uses to which this type of container is most adaptable, its use in export packaging, and the subject of cost in relation to the finished article. The need for standardization of size, shape, and units per case is emphasized. J.A.B.

SHIPPING CONTAINERS—MULTIWALL BAGS

ANON. Fiberglas looks to bag reinforcement following success with paper and tape. Paper & Paper Products 91, no. 21: 8-9 (July 20, 1950).

Brief reference is made to the superior performance qualities of Fiberglas-reinforced yarns incorporated in industrial papers, tapes, and nonwoven scrim. Work is now under way to develop a line of paper bags, reinforced with Fiberglas yarns, which promises to replace many types of multiwall bags now in use. 2 illustrations. E.S.

CHASE BAG COMPANY, *St. Louis.* Crinkled multiwall bag production expanded. Chem. Eng. News 28, no. 33: 2838 (Aug. 14, 1950); Chem. Processing 13, no. 8: 68 (August, 1950); Packaging Parade 18, no. 211: 66 (August, 1950); Chem. Inds. 67, no. 2: 311 (August, 1950).

Reference is made to the increasing use of all-crinkled multiwall paper bags, whose individual plies are made of wet-creped or secondary creped paper so that they retain 12-15% stretch in the longitudinal direction. Three, four, or five-ply bags are produced by laminating the individual sheets with a light coat of pliable adhesive. A feature claimed for these bags is their ability to expand and absorb shock and strain; another advantage is their good stacking quality. E.S.

SHIPPING CONTAINERS—PALLETIZING

BRAITHWAITE, W. E. Standardization for palletization. Modern Packaging 23, no. 12: 86-9 (August, 1950).

The results are given of a study carried out by the grocery industry's Committee on the Redesign of Packages to evaluate the strength and weaknesses of various packages and shipping containers with regard to palletizing. The recommendations of the committee are given concerning the dimensions, weight, and strength of shipping containers and the weight and size of pallet loads for the small (40 by 32 inches) and the standard (48 by 40 inches) pallets. It is suggested that the dimensions be marked clearly on the outside of each container, and the need for greater uniformity of terminology is pointed out. 2 tables and 8 illustrations. J.A.B.

SHIPPING CONTAINERS—STATISTICS

BETTENDORF, HARRY J. Fibre box industry statistics. Fibre Containers 35, no. 8: 145-56 (August, 1950); *cf.* B.I.P.C. 20: 116.

The production of the corrugated and solid fiberbox industry in 1949 amounted to a little over 63 billion sq. ft., a decline of 2% from the peak 1948 production; corrugated board was only 1% less, whereas solid fiber was down 15%. Perhaps the most significant trend during this period was the demand for better boxes made to exact specifications, with emphasis on correct dimensions. Detailed statistical information on both types of boxes is given in numerous tables, diagrams, and pie charts, many covering the ten-year period 1939-49. E.S.

HANWAY, PAUL S., and BETTENDORF, HARRY J. Fibre can and tube industry statistics. Fibre Containers 35, no. 8: 188-90 (August, 1950); *cf.* B.I.P.C. 20: 116.

Statistical information for the industry is given, showing an increase of six in the number of plants over 1948; board mill production is estimated to have increased 7% over 1948, whereas the over-all value of shipments is estimated to have declined 4% in value from 1948. 1 table and 1 diagram. E.S.

MATHER, GLENN, and BETTENDORF, HARRY J. Fibre drum industry statistics. Fibre Containers 35, no. 8: 191-2, 194-5 (August, 1950); *cf.* B.I.P.C. 20: 117.

Following a brief review on developments in connection with the growing fiber-drum industry, statistical data are given on the number of plants (17 in 1949 as compared with 19 in 1948) and the estimated number of units produced per year (19,600,000 as against 17,950,000 in 1948). An increase by three producing plants to 20 is indicated in 1950; it is anticipated that the 1950 production at the present rate will result in more than 20,000,000 units. 1 table, 1 graph, and 5 illustrations. E.S.

SHIPPING CONTAINERS—TESTING

L. O. KOVEN & BROTHER, INC. Tester for loaded containers. Chem. Eng. News 28, no. 33: 2838 (Aug. 14, 1950); Shears 68, no. 692: 42 (August, 1950); Fibre Containers 35, no. 8: 190 (August, 1950); Am. Boxmaker 39, no. 9: 31 (September, 1950).

A revolving drum tester is described which is built in two models for handling small-medium and medium-large size paperboard, fiberboard, and wooden shipping cartons and boxes. 1 illustration. E.S.

QUINN, DON L. Performance standard for articles in glass containers. Shears 68, no. 692: 32 (August, 1950).

A standard procedure is described for testing the adequacy of the packaging of articles in glass containers. This standard is based upon the application of the same intensity of shocks which the packed case is supposed to resist in actual shipment, and for which a safety factor for impacts up to eight miles per hour is provided. J.A.B.

RIDDELL, G. L. Package testing. J. Inst. Packaging no. 6: 34-8 (Exhibition no., 1949).

The importance of package testing in improving the quality and performance of packages is pointed out, and the chief package-testing laboratories in the U. S., France, Belgium, Holland, and England are mentioned. Brief descriptions are given of some of the general package tests, such as the drum test, inclined-plane test, drop test, compression test, vibration test, accelerated weather tests, and tests for moisture resistance, gas permeability, liquid resistance, mold resistance, and resistance to insect attack. Attention is drawn to the new PATRA package-testing service, available to both members and nonmembers. 1 table. J.A.B.

SMALL ORDERS

LEATHERS, W. G. Six approaches to problem of cutting merchant losses on small orders in face of rising costs. Paper & Paper Products 91, no. 23: 1, 6 (August 20, 1950); Paper & Twine J. 24, no. 6: 7, 10, 16, 30 (August, 1950).

The author discusses the problems of small orders for the paper merchant; these are not new but have become more serious today, because rising operating costs entail greater losses and move more orders into the loss column. A cost analysis of the operating and selling expenses of the average order below 100 pounds since 1939 and the average warehouse order in the same period is presented; the data indicate that the expenses in this 11-year interval increased more than the cost of merchandise under 100 pounds. The reverse is true of the average warehouse order, but to a lesser degree. Different suggestions for improving the loss on small orders are given. E.S.

SOLVENT CLEANING

KILSBY, E. R. The effect of solvent cleaning on boiler design. Pulp and Paper Manual of Canada 17: 41, 43, 45, 69 (1949).

The advantages and limitations of solvent cleaning in boilers are outlined. 5 diagrams. E.S.

STARCH

BOURNE, E. J., and WHELAN, W. J. Mechanism of the beta-amylolysis of amylose. Nature 166, no. 4215: 258-9 (Aug. 12, 1950); *cf.* B.I.P.C. 20: 348-9.

The evidence presented by Swanson and Cori (*cf.* B.I.P.C. 18: 471-2) in support of the "single-chain" theory of β-amylolysis of amylose is held untenable for the following reasons. The dialysis membrane used was permeable to chains having an average length of nine glucose units. Intermediate dextrins produced by a "multichain" mechanism would not be sufficiently small to pass the membrane until about 95% of the polysaccharide had been converted to maltose. Therefore, because the highest conversion attained during the experiment was only 80%, the amount of unhydrolyzed amylose (as obtained by dialysis) and the amount of maltose formed would be the same, regardless of whether the single-chain or multichain mechanism was operative. It is further held that the sharp peak in the priming power of con-

verted amylose for the synthetic action of potato phosphorylase would not be expected according to the single-chain mechanism, but it can readily be explained if simultaneous degradation of all chains occurs to produce dextrins of optimum activating ability (about 20 units). The work of Cleveland and Kerr (*cf.* Cereal Chem. 25: 133-9 [1948] and B.I.P.C. 20: 349) on extinction coefficients of butanol-fractionated hydrolyzates does not help to distinguish between the two theories because of preferential precipitation of longer chains by butanol. The question of whether the single-chain or multichain theory is correct is not yet resolved, but the authors maintain that the available evidence appears to support the multichain theory. 1 diagram and 7 references. J.W.S.

STATIC ELECTRICITY IN PAPER

WALKUP, LEWIS. Static electricity. Printing Equip. Engr. 80, no. 5: 56-7 (August, 1950).

Following a brief description of the manner in which static electricity is generated, neutralization methods (ionization by the needle-point principle or eliminators using small quantities of radium) are discussed. The author emphasizes the fact that a single-bar eliminator is usually not sufficient to remove all static encountered on one machine and that it is important to use as many bars as are necessary at the many points at which static is regenerated. To obtain the best results in a given process, the static problems must be studied so that the correct type of equipment is used in the correct manner in the proper places. Moisture-laden air has no more conductivity than dry air; under certain conditions it has even better insulating properties than dry air. It is sometimes quite possible to eliminate static by using the paper at the proper moisture conditions for which it was made, which in certain cases may involve the dehumidification of air to bring the paper down to the humidity for which it was designed. E.S.

STATISTICAL METHODS

HUGHSON, G. D. A sales talk for statistics. Pulp Paper Mag. Can. 51, no. 8: 85-6 (July, 1950).

Statistics is not one of the exact sciences and cannot be called an industrial cure-all; neither are all of its uses infallible. However, a statistical analysis will indicate to the analyst the probabilities of his being right or wrong in drawing conclusions from experimental data. The author discusses the type of problems which may be solved by statistical methods, notably control of product quality through statistical approach. No mathematical background is included. E.S.

WARBURTON, J. A. A discussion of possible errors. Pulp Paper Mag. Can. 51, no. 8: 83-4 (July, 1950).

The article is essentially a plea to those taking and using measurements to specify the accuracy of these measurements and to demand the information from others regarding the limits within which their figures are reliable. The two basic types of errors, systematic and random errors, are described, with particular emphasis on the second type, which is subdivided into the possible (I) and probable (II) errors. (I) indicates the maximum amount by which a reading can be in error and is an estimate based on experience; (II) is a statistical concept and is the most likely error in the mean of a number of values, all of which are subject to certain random errors. A method for arriving at the possible error is outlined, including an example. Calculations should be limited to decimal places which represent significant figures; otherwise it is a waste of time, and the presentation of figures which have the appearance of unwarranted accuracy is deceptive. E.S.

STRAIN GAGES

SILVERSIDES, C. R. The application of SR-4 strain gauges in woods operations in Eastern Canada. Pulp and Paper Manual of Canada 17: 87, 89, 91 (1949).

A general description of the SR-4 strain gage is given, and possible applications in woods operations are indicated. 1 figure and 6 references. E.S.

STRAW

SUTCLIFFE, H. M., ARONOVSKY, S. I., WILKINSON, R. M., BURNHAM, W. D., PHILLIPS, W. A., and CARPENTER, E. R. Improved straw pulp for corrugating paper. Tappi 33, no. 8: 353-7 (August, 1950).

A large number of experimental cooks were made on wheat straw, varying the amounts and kinds of chemicals in an attempt to produce improved pulps for corrugating. This work was part of a co-operative program between the strawboard industry and the Northern Laboratory and was carried on with the active collaboration of personnel from several strawboard mills. The chemicals used were lime, caustic soda, and sodium sulfite, singly and in various combinations. The pulps prepared with caustic soda or sodium sulfite and with combinations of these two chemicals were distinctly stronger than lime-cooked pulps. The optimum results in this series of experiments were obtained with 6% sodium hydroxide, 10% sodium sulfite, 2% sodium hydroxide plus 4% sodium sulfite, and 2% sodium sulfite plus 4% sodium carbonate. The results indicated that suitable refining of straw pulp may be fully as important as the method used in preparing the pulp. Because of its high hemicellulose content, straw pulp is an excellent material for producing corrugating paper with high-crush resistance. The results of this work offer the operating strawboard mills a wide latitude in the choice of cooking chemical to produce the desired improved product consistent with the variation in methods and equipment used in each mill. 1 table, 5 figures, and 3 references. E.S.

SULFATE MILLS

CANADIAN PULP AND PAPER INDUSTRY. Wood utilization studies led to kraft mill. Can. Pulp Paper Ind. 3, no. 8: 19-37, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 82, 84, 86, 88, 92, 94, 96, 98, 100, 102, 104 (August, 1950); *cf.* B.I.P.C. 20: 667.

Nearly the entire August issue is devoted to a profusely illustrated description of the different departments of the new bleached sulfate mill of the H. R. MacMillan Export Co. Ltd., Pulp Division, at Nanaimo on Vancouver Island, which was officially opened on August 14. Details of the woodroom, four-digester room with heat-recovery system, the Fourdrinier pulp-drying machine, the recovery and recausticizing departments, the steam system and power supply, the differential control on the pulp-drying machine, personnel, suppliers of equipment, and construction work are given. The mill is nominally rated at 250 tons daily capacity; however, it has been designed and laid out to be doubled, if desired. 1 large flowsheet and numerous illustrations. E.S.

SULFITE WASTE LIQUOR

BENDER, F. Calcium removal from sulphite waste liquor by electrolysis. Pulp Paper Mag. Can. 51, no. 8: 73-6 (July, 1950).

Preliminary experiments on the possibility of using electrolysis for the removal of calcium from sulfite waste liquor are described. It was found that

if a direct current is passed through the liquor in a stationary diaphragm cell, the following changes take place: anolytes become more acidic, and catholytes more alkaline. Calcium compounds are deposited at the cathode, and the calcium content of the anolyte decreases. The same changes are obtained in a cell designed for continuous operation. The possibility of applying these observations to the evaporation of sulfite waste liquor is discussed. 3 tables, 5 figures, and 7 references. E.S.

KENNEDY, E. H., and COLDWELL, F. H. Calcium base sulphite liquor burning tests. Paper Mill News 73, no. 31 : 12, 14-17 (Aug. 5, 1950) ; Pulp & Paper 24, no. 11 : 84, 86, 88, 90 (October, 1950).

Tests by the Sulphite Pulp Manufacturers Research League with the burning of sulfite waste liquor (about 52% dry solids) in a completely water-walled furnace installed by Combustion Engineering-Superheater, Inc. at the Nekoosa, Wis. mill of the Nekoosa-Edwards Paper Co. are described. The main purpose was not a duplication of previous tests, but the clarification of certain points, such as the efficiency at which the liquor could be burned in such a unit, the amount of liquor which could be used in relation to the total fuel used, the completeness of combustion, and the possibility of controlling the fly-ash nuisance with a commercial collector found satisfactory for powdered coal. Details of the boiler, furnace, sulfite liquor equipment, and the testing procedures are given. Both the mechanical and the steam-atomizing types of atomizers were used for the burning of the liquor; the mechanical equipment gave the better results. The atomizing tips of carbon steel showed rapid erosion, and a different material will have to be selected. Steam-atomizing tips with their lower liquor velocities will stand up longer under service than mechanical atomizing tips. A liquor-burning efficiency of 74% was reached in the tests, as compared with 83% obtained by the boiler unit with coal. The difference is occasioned principally by the additional moisture in the liquor which must be evaporated and superheated to the exit gas temperature. From the comparatively short tests it does not appear that any trouble from furnace, boiler-tube, or superheater-tube fouling will be encountered as long as the liquor is atomized sufficiently, and the furnace is large enough to burn the fuel completely. The problem of handling the ash is similar to that of pulverized coal ash, and apparently can be accomplished in the same way and by the same means. However, about 1.5-2 times as much ash results from burning sulfite liquor as from coal for the same heat input. To permit economical operation, liquor must be collected at maximum solids content and evaporated to as great a degree as can be done physically. These conditions will vary according to cooking procedures, so that each mill considering this method of disposal will have to evaluate its own problem. However, the general statement can be made that no mill can hope to break even in these operations, until it can produce a liquor, evaporated to burnable consistency, at a cost considerably less on a B.t.u. basis than the commercial fuel it is presently using. 3 tables and 9 figures. E.S.

SULFUR DIOXIDE

KATZ, MORRIS. Photoelectric determination of atmospheric sulfur dioxide. Anal. Chem. 22, no. 8: 1040-7 (August, 1950).

Dilute solutions of starch-iodine have been found suitable for the continuous determination of low concentrations of sulfur dioxide in smelter areas where hydrogen sulfide is not likely to occur. The most effective concentration range of solution is from about 7×10^{-5} N to 2×10^{-5} N. The apparatus for the continuous recording of sulfur dioxide consists of a Thomas analyzer, two gas bubblers containing 100 ml. of solution mounted

in a block with a light source between them, and two photoelectric cells. The output current is passed through a standard resistance box, and the voltage drop across the 0- to 500-ohm terminals is measured by a potentiometer with a scale range of 0 to 50 mv. The instrument has a range of less than 0.01 to 1.00 p.p.m. or more, depending upon the size of the gas sample and the volume of solution used in the absorbers. The results of several tests in smelting districts indicate that a substantial fraction of the smelter smoke during a fumigation may consist of sulfur trioxide, sulfuric acid, or sulfate. 6 tables, 5 figures, and 19 references. J.A.B.

TALL OIL

ALEXANDER, ALLEN L., BENEMELIS, R. L., and CRECELIUS, S. B. Antifouling paints; tall oil and rosin derivatives in toxic paint vehicles. Ind. Eng. Chem. 42, no. 8: 1562-5 (August, 1950).

As a result of the huge quantities of rosin consumed in the wartime production of antifouling paints, studies were inaugurated with a view of determining the role of rosin substitutes for use in soluble-matrix antifouling paint. The advent of tall oil in commercial quantities made it an interesting prospect for this study. In addition, tall oil esters of glycerol and pentaerythritol were prepared and studied along with abietic acid and hydrogenated methyl abietate as rosin diluents. The esters appear to affect antifouling efficiency and physical durability adversely in direct ratio to the extent to which they are substituted. Abietic acid and hydrogenated methyl abietate improve perceptibly the physical qualities of the film. Tall oil may be substituted for rosin up to 50% without affecting the performance of the paint. 5 tables, 5 figures, and 4 references. E.S.

JAKOBSON, TORSTEN. Tall oil or liquid rosin; a review of the literature. Svensk Papperstidn. 52, no. 11: 290-4; no. 15: 379-82; no. 18: 451-3; no. 19: 481-2 (June 15, Aug. 15, Sept. 30, Oct. 15, 1949); 53, no. 13: 369-75; no. 15: 444-6 (July 15, Aug. 15, 1950). [In German] *cf.* B.I.P.C. 19: 730.

Continuing his previous review, the author adds three corrections and 317 references (nos. 447-763) to his bibliography, covering the period from 1945 to 1949, although some earlier references are also included. E.S.

JOHANSON, STIG, and LINDAHL, GUSTAV. Dispersion of tall oil rosin acids in water for the preparation of paper size. Svensk Kem. Tid. 62, no. 3: 95-105 (June, 1950). [In German] *cf.* B.I.P.C. 20: 909-10.

Tall oil rosin acids (I) are suitable for the preparation of completely saponified sizes of the Delthirna type, but not for the preparation of emulsified sizes with a high free rosin content, such as the Bewoid size; the high melting point and the tendency to crystallize are considered responsible for the failure in the second case. In the distilling plant of the Mo och Domsjö AB in Sweden, (I) are not isolated in the form of crystals (as in most other Swedish plants), but in the molten, amorphous form. The resulting product has a lower melting point and a lesser tendency to crystallize than ordinary (I), but, in spite of it, is not suitable for the preparation of Bewoid size. The purified amorphous (I) behave on dispersion similar to crystalline (I); they either solidify on the walls of the dispersion vessel or they yield very coarse-grained dispersions. As a rule, the less pure, amorphous (I) coagulate on cooling. The dispersing properties can be improved by partial saponifica-

tion of (I) with alkali; however, rosin acids treated in this manner become sensitive to water and show a tendency to become highly viscous. If the degree of saponification and the fatty acid content are high, thickening may take place in the course of dispersion, otherwise later during cooling or storage. Of about 50 samples of amorphous or moderately saponified (I), one alkali-treated, amorphous sample yielded a stable dispersion free of crystals or seed crystals, which remained unchanged after six months' storage. This is exactly the opposite behavior of all other samples; it has not yet been possible to determine the reason of this exceptional occurrence. In all other cases where crystals or seed crystals were present, they occurred in the dispersed component as well as in the disperse phase. 7 tables, 5 figures, and 5 references. E.S.

MUELLER, E. R., ENESS, P. L., and MCSWEENEY, E. E. Preparation of tall oil esters. Ind. Eng. Chem. 42, no. 8: 1532-6 (August, 1950).

Tall oil was esterified with three different polyhydric alcohols: glycerol, pentaerythritol, and sorbitol. The effect of temperature, catalyst, carbon dioxide flow rate, and amount of alcohol on the rate of esterification and changes in the color, viscosity, and drying time of the ester was studied. Within practical esterification temperatures, catalysts had no appreciable effect upon the esterification rate of any alcohols studied. An excess of 10% alcohol (over stoichiometric) produced the maximum rate obtainable for glycerol and pentaerythritol; acid numbers of 10 were readily obtained. Four and one-half equivalents of tall oil per mole of sorbitol yielded esters with acid numbers over 20. For the temperatures investigated (437, 475, 526, 560, and 585° F.), no advantage in esterification is gained by the use of temperatures higher than 526° for glycerol, 535° for sorbitol, or 560° for pentaerythritol. The color, viscosity, and drying time of the esters were not appreciably affected in any case. 6 tables, 5 figures, and 11 references. E.S.

SNELL, FOSTER DEE, and REICH, IRVING. Comparative value of fatty acids and resin acids of tall oil in soaps. J. Am. Oil Chemists' Soc. 27, no. 8: 289-95 (August, 1950).

A study has been made of the detergency and foaming power of soaps made from a typical acid-refined American tall oil. The sodium soap of tall oil, a straight tall oil fatty-acid soap, and a straight tall oil resin-acid soap were evaluated. The effect of the fatty acid-resin acid ratio was determined by using mixtures of those soaps. Sodium rosinate, sodium oleate, and mixtures of these soaps were used as comparison standards. Curves were plotted which show the wash-test data and foaming values as functions of the ratio of fatty soap to resin soap. The data indicate in terms of detergency: (*a*) tall oil soap has a higher value than sodium rosinate; (*b*) sodium oleate is better than tall oil fatty-acid soap, but the latter is approximately equivalent to soaps from various unsaturated vegetable oils; (*c*) both tall oil resin-acid soap and rosin soap have low detergency on cotton; (*d*) the detergency of most mixtures of tall oil fatty-acid and resin-acid soaps at lower concentrations is greater than would be predicted from the individual soaps, indicating a synergistic effect. As a rough approximation, tall oil soap without unsaponifiables is equivalent to a corresponding mixture of sodium oleate and sodium rosinate. The presence of unsaponifiables lowers both detergency and foaming. Tall oil soap is somewhat less sensitive to hard water than sodium oleate. Significant differences between detergencies of soaps, and especially between soap mixtures, are obscured when Launder-Ometer tests are run at moderate soap concentrations. These differences are readily detected at lower concentrations. 5 tables, 6 figures, and 6 references. E.S.

TANNINS

BUCHANAN, M. A., LEWIS, H. F., and WEBER, W. B. Purification and chemical properties of certain vegetable tannins. J. Am. Leather Chemists Assoc. 45, no. 8: 513-30 (August, 1950).

Tannin analyses of the purified extracts of quebracho, wattle, mangrove, chestnut, and myrobalan were made in a fundamental study of the effect of the chemical structure on tanning properties. The hide-powder purification was found to be a satisfactory means of preparing relatively small amounts of high-purity products from all the extracts studied, although the ease of purification was not the same in all cases. These products, however, represent only a part of the original tannin and, in addition, probably consist of mixtures of tannins rather than of a single chemical substance. The purified tannins which belong to the condensed class (quebracho, wattle, and mangrove) contained approximately 61-63% carbon, and the hydrolyzable tannins (chestnut and myrobalan), 52-53%. All the purified tannins contained small amounts of methoxyl and nitrogen, which were probably not combined with the main part of the tannin. 12 tables, 2 figures, and 19 references. E.S.

CHEN, PHILIP S. Qualitative analysis of syntans. J. Am. Leather Chemists Assoc. 45, no. 8: 531-6 (August, 1950).

A scheme for the qualitative analysis of syntans is presented which provides for the differentiation between natural and synthetic tannins and the qualitative analysis of syntans, divided into six groups, including the chromiates of sulfite waste liquor (Syntan 17-C). The various tests employed in the proposed scheme are discussed briefly. 2 tables and 2 references. E.S.

TEXTILE INDUSTRY AND FABRICS

SCOTT, RICHARD C. 1950 textile bibliography. Textile World 100, no. 8: 87-98 (August, 1950).

An extensive list is given of the important books on textile technology and the textile industry which have been published in the English language. The bibliography is divided for convenience into 20 subject headings, and a directory of publishers is included. J.A.B.

ULTRASONICS

MOREHEAD, FREDERICK F. Ultrasonic disintegration of cellulose fibers before and after acid hydrolysis. Textile Research J. 20, no. 8: 549-53 (August, 1950).

Experimental results are presented to show that the dimensions of the particles obtained when cellulose fibers are subjected to acid hydrolysis, followed by ultrasonic vibration, are in good agreement with the viscosity data, and that these particles are apparently related to the crystalline and amorphous structure of the original fiber. When the sample is subjected to ultrasonic disintegration alone, without previous hydrolysis, fibrils are obtained which are almost electron optically transparent. Both preparatory procedures for electron-microscopic examination are described, and the results are tabulated. Both native and regenerated fibers were used in these investigations, and the former were found to have much longer and larger crystallites; this may possibly explain the difference in water sorption of the hydrolyzed samples from the dry state under standard humidity conditions. 3 tables, 2 electron micrographs, and 13 references. J.A.B.

SIMPSON, F. W., and MASON, S. G. Note on the treatment of cellulose fibres with ultrasonic waves. Pulp Paper Mag. Can. 51, no. 8: 70-2 (July, 1950).

Some preliminary experiments on the effect of exposing pulp suspensions to a high-intensity ultrasonic field with a frequency of 500 kilocycles have shown conclusively that physical changes, similar to those produced by ordinary beating, such as decreased freeness and increased strength, result from such treatment. Although no reliable estimate of the energy consumption in these experiments was possible, it is evident that it was many times greater than that required by ordinary beating methods to produce a similar effect. There was no measurable change in cuprammonium and cupriethylenediamine viscosities. Microscopic examination of the treated fibers revealed two effects: development of spiral fibrillae and ballooning. It is suggested that such treatment may prove a useful aid in the microscopic examination of fibers. 4 tables, 2 figures, and 4 references. J.A.B.

UPKEEP PAINTING

OYSTER, L. S. Maintenance painting specifications for paper mills. Paper Trade J. 131, no. 8: 16, 18-28 (Aug. 24, 1950).

The first part of the article contains information concerning construction defects, mildew conditions, alkalinity or lime burning, surface preparation, drying times, treated and untreated lumber, acid- and alkali-resistant finishes, painting systems, and painting schedules. The second part includes detailed painting specifications for the filter plant, sawmill, woodroom, boiler house, hydroelectric plant, turbine room, generator room, and the different departments in groundwood, sulfite, sulfate, and rag mills. In each case, the primer, undercoater, and finish coat are listed for every surface. J.A.B.

VANILLIN

PEARL, IRWIN A. Vanillic acid esters in cosmetics. Am. Perfumer Essent. Oil Rev. 56, no. 1: 25-8 (July, 1950).

The author points out the areas of the cosmetics field in which the esters of vanillic acid prepared from by-products of the pulp industry might prove valuable. The specific toxicity of these esters toward certain micro-organisms, their nontoxicity toward animals, and their characteristic ultraviolet absorption properties indicate their usefulness as preservatives for cosmetic preparations, as sunscreen agents for sunburn prevention and for tanning, and as plasticizers and ultraviolet protectors for packaging materials. I.A.P.

WASTE HEAT

OLSSON, TORGNY. The waste-heat situation in the sulfite mill at Essvik. Svensk Papperstidn. 53, no. 13: 356-60 (July 15, 1950). [In Swedish; English summary]

The sulfite mill at Essvik produces 36,000 metric tons of bleached sulfite pulp per year and also operates a sulfite alcohol fermentation and distillation plant. The waste-heat sources available at the mill and the improvements in their utilization are described; the latter involved the installation of a scrubber for recovering the heat of the flue gases and a new air-preheater construction. Although only relatively small units are involved, the efficiency of the boiler plant is about 92-93%, if the utilized waste heat is considered to be equivalent to live steam. 10 figures. E.S.

THORSON, BÖRJE. Waste-heat problems. Svensk Papperstidn.

53, no. 13: 361-5 (July 15, 1950). [In Swedish; English summary] *cf.* B.I.P.C. 20: 789.

In the discussion of heat problems in the pulp industry, primary and secondary heat is involved. Primary heat includes all calories delivered in live steam for the manufacture of pulp, whereas secondary heat is waste heat from the different processes which can be reclaimed to perform useful work. The author discusses the available sources and required waste heat in four types of mills (unbleached and bleached kraft mills and strong and dissolving-type sulfite mills). The waste-heat problems in paper, board, and groundwood mills are mentioned in a general way; brief reference is also made to the planning and maintenance of waste-heat installations. 4 tables and 1 reference. E.S.

WASTE PAPER

BECKWITH, W. H., and BETTENDORF, HARRY J. Wastepaper statistics. Fibre Containers 35, no. 8: 115-23 (August, 1950); *cf.* B.I.P.C. 20: 127.

Waste paper consumption reached its highest level in 1947 when 8,009,000 tons were used in the manufacture of paper and paperboard. Since then it has decreased, falling to 7,649,000 tons in 1948 and to approximately 6,553,000 tons last year. Of particular interest is the fact that 1948 paper and paperboard production attained a record high, but waste-paper consumption had reached its peak a year earlier. The explanation of this drop lies in quality. Consuming mills have found that much of the waste paper they receive has not been of sufficient quality to manufacture paperboard which will be acceptable to the discriminating consumer; poor-quality waste paper is far more expensive than pulp. There will always be a need for waste paper, but the extent to which that need develops depends upon the quality with which it is packed and handled. The business will go to those dealers who supply top quality. Of the 6.5 million tons of waste paper consumed last year, about 77.6% was used for board, 7.9% for roofing, and 14.5% for paper, which are 14, 7, and 17%, respectively, less than in 1948. Numerous tables, diagrams, and pie charts. E.S.

WATER AND WATER TREATMENT

GUYTON, W. F. Industrial use of ground water. Tappi 33, no. 8: 36A, 38A, 40A (August, 1950).

The U. S. Geological Survey is the primary federal agency designated by Congress to make basic investigations of the nation's water sources. No construction, development, or operation of water supply is involved in its work, but only studies to determine the occurrence, quality, and quantity of ground and surface water. The means by which co-operation with various water users is obtained are discussed. The quality of ground water and points for consideration in its use are outlined. Several case histories are discussed in which the availability of water was a critical problem. 1 table. E.S.

MATAGRIN, AM. Water in the paper industry. I. Required quantities and desirable qualities. Papeterie 70, no. 8: 233-7; no. 9: 285, 287-9; no. 10: 317-19, 321; no. 11: 358-9, 361, 363-5, 367; no. 12: 399, 401 (August-December, 1948). II. Comparative technical value of rain, surface, and spring waters. Papeterie 71, no. 1: 7, 9-11; no. 2: 43, 45-7; no. 3: 91, 93-6; no. 4: 133-7 (January-April, 1949). III. Study of scientific methods of prospecting for water and of the yet unexplained art of the use of

the divining rod. Papeterie 71, no. 5: 162-3, 165, 167; no. 6: 203, 205, 207, 209, 211, 213; no. 7: 247, 249, 251, 253, 255; no. 8: 300-3, 305; no. 9: 345, 347, 349, 351-2; no. 11: 439, 441-3 (May-September, November, 1949); 72, no. 1: 15, 17, 19-21; no. 2: 79-81; no. 3: 131-3, 135, 137; no. 5: 245, 247, 249, 251; no. 6: 315, 317-18; no. 7: 377, 379-80 (January-March, May-July, 1950). [In French]

A comprehensive review with a total of 252 references. L.E.W.

POWELL, SHEPPARD T., and BACON, HILARY E. Magnitude of industrial demand for process water. J. Am. Water Works Assoc. 42, no. 8: 777-85 (August, 1950).

The author reviews the industrial water-system capacity in the United States, water sources and use, the consumption by specific industries, the availability of the industrial water supply, water waste, and possible corrective measures. The statistical data are taken from the 1947 "Census of manufactures." The steel industry outstrips all others in its use of water, requiring 65,000 gallons per ton of finished product; next to steel in order of water use are the petroleum products, wood pulp, paper, and coke industries. The following estimated quantities for the pulp and paper industry are given: sulfate, 64,000; sulfite, 60,000; soda, 85,000; groundwood, 5000; paper, 39,000; and paperboard, 15,000 gallons per ton. 4 tables, 4 figures, and 5 references. E.S.

WAXES

RABAK, WILLIAM. Protective packaging with molten thermoplastics. Paper Trade J. 131, no. 8: 28-9 (Aug. 24, 1950); Modern Packaging 23, no. 10: 140-1 (June, 1950).

The low-melting point, soft, microcrystalline paraffins manifest excellent low-temperature flexibility and at the same time are effective moisture barriers. Their flexibility is improved with plasticizing agents, such as certain of the polyisobutylenes, crepe rubber, and other compounds. These modified paraffins have been found to possess other unusual low-temperature adhesion and expansion characteristics which make them suitable for the dip-coating of frozen commodities; coating thickness may be regulated by temperature, timing, and repetitive immersions. J.A.B.

WET STRENGTH

ANON. Wet strength papers—what they are and why they are objectionable as wastepaper. Paper Trade J. 131, no. 9: 13 (Aug. 31, 1950); Shears 50, no. 693: 12 (September, 1950).

Broadly defined, wet-strength papers include all those which exhibit greater than normal resistance to defibering in water, but the restricted definition refers only to those containing wet-strength resins. A list is given of papers and paper products which contain sufficient amounts of wet-strength agents to be considered objectionable as waste paper. J.A.B.

FINEMAN, MANUEL N., and GRUNTFEST, I. J. Mechanism of the retention of beater added urea resins. Tappi 33, no. 8: 357-60 (August, 1950).

A review of the literature on the application of urea-formaldehyde wet-strength resins to paper shows that controversies exist about both the mechanism of the process and the performance to be expected. The experiments

which are described leave no doubt as to the importance of the ionic character of both resin and pulp to the mechanism of retention. There appears to be no reason to isolate the problems of urea-resin retention from those of other beater additives such as rosin, dyes, fillers, and melamine resins. Cationic urea resins are found to give high efficiencies even on thoroughly bleached pulps. Statements about the performance of urea resins as a class are shown to be precarious, however, unless both resins and pulps are defined in detail. 5 tables and 16 references. E.S.

WHITE WATER

CALISE, V. J. Factors in white water treatment. Tappi 33, no. 8: 361-4 (August, 1950); *cf.* B.I.P.C. 20: 912.

The author deals with various types of equipment now available for reducing loss of stock in white waters from pulp and paper mills. In particular, two modern designs of reclaimers are described in detail, both embodying the principle of contacting the incoming white water with previously accumulated solid precipitates and stock in order to effect virtually the complete removal of stock from the white water. An actual example of a complete engineering calculation of such a reclaimer installation is shown with equipment costs, installation costs, operating costs, and savings obtained. 1 table, 3 figures, and 1 reference. E.S.

WOOD OPERATIONS

HEMMINGSEN, JOHN O. Mechanical logging development in Newfoundland. Pulp and Paper Manual of Canada 18: 57, 59, 61, 63, 65, 67, 69 (1950).

The author describes the conventional logging methods of cutting and hauling in Newfoundland and the present development in mechanical logging, with particular reference to bundling slings, the multiple bundle arch or packet, bundled yarding operations, and primary experiments on the mechanical concentration of tree-length pulpwoods. 16 illustrations. E.S.

IRVIN, B. D. Off the road transportation. Pulp Paper Mag. Can. 51, no. 8: 98-100, 102 (July, 1950).

The author defines off-the-road operations as those which will not allow the economical and efficient use of standard commercial trucks for one reason or another, and discusses this problem in reference to woodlands operations of the pulp and paper industry. Reference is made to a specific vehicle development now under investigation, a machine which will move tree-length wood on off-the-road hauls faster and more cheaply than can be done with any existing equipment. E.S.

KIRKPATRICK, R. E. The Bailey bridge for woodlands use. Pulp and Paper Manual of Canada 17: 92-3, 95, 97 (1949).

A brief description of the essential features of the Bailey bridge, a British wartime development, is given, and the erection of such a bridge across the Mattawin River on the limits of the Consolidated Paper Corp. in Canada is outlined. 9 figures and 4 tables. E.S.

MANLEY, LEANDER. The growth of B.C. forest industries. Can. Pulp Paper Ind. 3, no. 8: 72, 74, 76, 78, 80 (August, 1950).

Following a brief historical review of British Columbia's start of its pulp and paper industry, the early logging methods, the introduction of the high

lead system and heavy equipment for difficult terrain, and present mechanized equipment and procedures are mentioned. E.S.

THOMAS, P. R. Logging steep mountain slopes with the Wyssen cableway. Pulp and Paper Manual of Canada 18: 71, 73-4 (1950).

The author describes the experience of Price Brothers in one of their logging operations with the Wyssen cableway, a Swiss development limited to steep slopes. It is a single-track, gravity, aerial tramway similar to the tight skylight system. The installation and sequence of operations are outlined; the experience gained with the cableway indicates that, technically speaking, the system is perfectly adequate for steep-slope logging. The cost per unit was somewhat higher than expected but, with slight modifications in the operating methods and a more experienced crew, a cost reduction to reasonable levels is considered feasible. 4 tables. E.S.

WOOD TRANSPORTATION

GUNTER, E. H. Truck hauling. Pulp and Paper Manual of Canada 18: 75, 77, 79 (1950).

The author emphasizes the advantages of co-ordinating the various logging operations and describes the savings in operating cost obtained by the direct hauling of pulpwood from pile to river by trucks on summer roads from distant areas over steep grades, which are otherwise considered to be very expensive to operate. Certain disadvantages are involved in this system, such as the reduction of winter work for farmers and bush staff. 4 tables. E.S.

WILLISCROFT, A. D. Report on use of "Caterpillar" D.W. 10 wheel type Diesel tractor for the hauling of softwood logs on sleighs on the operations of Price Brothers & Company near Rimouski, Quebec. Pulp and Paper Manual of Canada 17: 71-7 (1949).

Data of field tests are presented which indicate that this type of tractor is a very flexible and efficient hauling unit on snow and ice roads. 1 illustration and 13 tables. E.S.

WOOD WASTE

SPRINGATE, N., and MEISSNER, H. G. Burns wood waste by spreader stoker. Power 94, no. 8: 85-7 (August, 1950).

The authors describe the advantages of the spreader-stoker fired, hogged-fuel furnace recently installed by the Pacific Veneer and Plywood Division of Canadian Forest Products, Ltd., New Westminster, B.C. The fuel comprises various percentages of wet bark, sap chips, wet veneers, core chips, dry veneer, and plywood and hardboard scraps with a moisture content ranging from 3.4 to 50% or more. 1 table and 6 figures. E.S.

WOOL

STAHL, WILLIAM H., MCQUE, BERNARD, MANDELS, GABRIEL R., and SIU, R. G. H. Studies on the microbiological degradation of wool; digestion of normal and modified fibrillar proteins. Textile Research J. 20, no. 8: 570-9 (August, 1950).

Measurements of the susceptibility of various keratins and fibrillar proteins to digestion by a keratinolytic fungus were made, using both normal and modified proteins. Digestion of the following fibrillar proteins by *Microsporum gypseum* over a 21-day period was, from the highest percentage digestion to the lowest: collagen, feather, hoof, wool, horn, horsehair, mohair,

and silk. The primary factors which determine the rate of digestion of fibrillar proteins were found to be the chemical composition and the molecular architecture. In keratins, the degree of polymerization assumes the greatest importance. The higher the degree of polymerization, primarily attributed to the disulfide cross-linkages, the more resistant the keratin is to enzymic digestion. The histological complexity of keratinaceous tissues and geometrical structure of the keratin molecule do not influence the rate significantly. 4 tables, 9 figures, and 23 references. J.A.B.

X-RAY RESEARCH

JØRGENSEN, LEIF, and RIBI, EDGAR. X-ray analysis of the swelling of wood pulp in sodium hydroxide solution. Nature 166, no. 4212: 148 (July 22, 1950); *cf.* B.I.P.C. 20: 706.

In an extension of the work described in the previous reference, the x-ray diffraction patterns of two pulp samples swelled in sodium hydroxide solution were observed. An accompanying table shows that the x-ray analysis was in full agreement with the hydrolysis and water-absorption properties, which are sensitive indicators of intracrystalline swelling. 5 references. J.A.B.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications. Because of the delay in securing patents from the Canadian Patent Office, no abstracts of Canadian patents will appear in this issue.

ADHESIVES

BUCKLEY, WALTER D., MCCOY, PAUL E., and THOMPSON, LYNDON G. Method of preparing an adhesive by mixing a rubber latex, filler, and a bituminous emulsion. U. S. patent 2,506,339. Filed May 10, 1946. Issued May 2, 1950. 14 claims. Assigned to Stancal Asphalt & Bitumuls Company. [Cl. 260-28.5]

An adhesive composition is characterized by its quick set when it is spread as a film between two plies of paper and pressure is applied; the glued paper product exhibits a high resistance to wet and dry delamination. The adhesive comprises a mixture of a butadiene-styrene latex, polyvinyl alcohol, bentonite clay, and a quick-breaking asphalt emulsion. E.G.S.

ALKALINE PROCESSES—FURNACES

HAMM, ALEXANDER L. Superheater for chemical recovery units. U. S. patent 2,519,566. Filed Nov. 10, 1945. Issued Aug. 22, 1950. 8 claims. Assigned to Combustion Engineering-Superheater, Inc. [Cl. 122-476]

A chemical recovery furnace for the processing of black liquor incorporates a bank of superheater tubes. Where the superheater is exposed to gas temperatures of 1350° F. or above, the tubes are widely spaced, and in the lower-temperature regions are more closely spaced. The wide spacing arrangement permits a substantial portion of the gases to flow between the tubes without making contact with their surfaces, thus minimizing the condensation of salts (e.g., sodium carbonate and sulfate) on the tubes. 5 figures. E.G.S.

BOARD

BOEHM, ROBERT M. Process of sizing exploded fibers. U. S. patent 2,516,847. Filed Dec. 1, 1944. Issued Aug. 1, 1950. 4 claims. Assigned to Masonite Corporation. [Cl. 92-1]

Hardwood chips are charged into a closed gun chamber (*cf.* U. S. patent 1,824,221, issued Sept. 22, 1931), and about 20% of powdered Vinsol (based on the dry weight of the chips) is sprinkled into the body of the chips. The material is preheated by increasing the steam pressure to about 600 p.s.i. in about 30 seconds; then the steam pressure is quickly raised to 1000 p.s.i. and held for 15 seconds, after which the contents of the gun are discharged. The resultant mixture is refined, formed into laps, dried, and then heated for 30 minutes at 130° C. A two-ply lamination of the material is pressed for about 15 minutes at 1500 p.s.i. between platens which have been heated to about 185°; the platens are subsequently chilled below 100° while the pressure is maintained on the product. The resulting material has a dielectric strength of 476 volts per mil and is suitable for use in switchboard panels. E.G.S.

MUENCH, CARL G. Apparatus and method of manufacturing boards. U. S. patent 2,518,806. Filed Oct. 20, 1943. Issued Aug. 15, 1950. 7 claims. Assigned to Celotex Corporation. [Cl. 92-39; changed to 18-10]

A process for the manufacture of hardboard from lignocellulosic fibers comprises the steps of forming a felted sheet which has a moisture content of 2-10% and which incorporates 2-12% of added binder material; passing the sheet into a high-pressure atmosphere of 200-800 p.s.i. and thus heating it to about 400° F.; compressing the sheet between heated rolls at a pressure of 500-1000 pounds per lineal inch across the width of the rolls; cooling it to a temperature below 200°; and discharging the product from the high-pressure atmosphere. 6 figures. E.G.S.

VEITCH, ISAAC E. Molded product. U. S. patent 2,517,261. Filed Oct. 8, 1949. Issued Aug. 1, 1950. 7 claims. [Cl. 260-29.4]

A molded wallboard incorporates granulated blast furnace slag as a filler; the binder consists principally of sodium silicate, together with 0.3-4.0% by weight of a cold-setting, urea-formaldehyde condensation product. 1 figure. E.G.S.

BOARD, CORRUGATED

IVES, CHARLES Q. Packaging material. U. S. patent 2,518,550. Filed Feb. 18, 1948. Issued Aug. 15, 1950. 7 claims. [Cl. 154-55]

A flexible, double-faced corrugated board may be wrapped around articles of any shape, including bottles, books, glassware, pictures, and furniture; it is claimed that the packaging material affords substantially the full protection and cushion value of flat, double-faced corrugated board. The board is rendered flexible by the incorporation of a tilelike facing ply whose surface consists of individual, separated, frusto-pyramidal segments. 5 figures. E.G.S.

BOARD, LAMINATED

CAMP, THOMAS P., and KOLMODIN, CHESTER N. Laminated structure and adhesive therefor. U. S. patent 2,518,281. Filed July 24, 1943. Issued Aug. 8, 1950. 5 claims. Assigned to United States Gypsum Company. [Cl. 154-45.9]

A laminated wallboard structure comprises several sheets of paper-surfaced gypsum board which are united by a water-resistant adhesive. The adhesive contains the following ingredients: 5% of an emulsified asphalt of the clay type, 10% of a partially dextrinized, farinaceous paste, and 85% of water. 1 figure. E.G.S.

WEYMOUTH, LAWRENCE B. Laminated panel and method of making the same. U. S. patent 2,517,069. Filed Jan. 8, 1947. Issued Aug. 1, 1950. 5 claims. Assigned to Briggs Manufacturing Company. [Cl. 154-106]

A laminated panel is adapted for trimming the interior of automobile bodies. The structure comprises a bottom thin paper sheet of uniform texture which is impregnated with a phenol-formaldehyde resin; a relatively thick sheet of compressible corrugated board which is superimposed upon the paper sheet; a second impregnated, thin paper sheet which is superimposed upon the board; and a top decorative sheet which is superimposed upon the second paper sheet. The corrugated board and the decorative sheet are bonded together by the second paper sheet; the bottom sheet is bonded directly to the surface of the board to render it waterproof and to serve as a reinforcement. 3 figures. E.G.S.

BOARD SPECIALTIES

CROSS, CARROLL N. Card mount. U. S. patent 2,517,535. Filed Jan. 7, 1949. Issued Aug. 8, 1950. 6 claims. [Cl. 40-158]

A photographic mount incorporates integral card-mounting pockets, together with card corner-receiving slots. The mounts can be stacked evenly on one another for storage or shipment. 5 figures. E.G.S.

FINE, JOHN A., SR. Collar support. U. S. patent 2,518,300. Filed Nov. 5, 1946. Issued Aug. 8, 1950. 2 claims. [Cl. 223-83]

A collar support of the double-bracing type incorporates means for engaging the front of a new or freshly laundered shirt to prevent the support from shifting from side to side. 8 figures. E.G.S.

HENNESSEY, RUSSELL J. Display carton. U. S. patent 2,518,779. Filed Jan. 26, 1946. Issued Aug. 15, 1950. 1 claim. Assigned to Waldorf Paper Products Company. [Cl. 206-45]

A display carton is provided which will support a series of rolls of tape or similar material in a series of stepped rows, so that each roll is visible when the carton is in the open or display position. 10 figures. E.G.S.

HOCHSTEIN, HAROLD B. Megaphone formed of bendable material. U. S. patent 2,517,665. Filed Sept. 13, 1947. Issued Aug. 8, 1950. 4 claims. Assigned one fourth to Irving Schwartz. [Cl. 181-27]

A megaphone is formed from a single sheet of cardboard and is provided with a finger grip. 4 figures. E.G.S.

KIES, ELLIOTT J. Tire sign display. U. S. patent 2,517,884. Filed April 18, 1947. Issued Aug. 8, 1950. 4 claims. Assigned to The Massillon-Cleveland-Akron Sign Company. [Cl. 40-125]

A cardboard, fiberboard, or sheet-metal tire sign display has three-dimensional characteristics, so that part of the display surfaces are in different planes. The structure can be adjusted to accommodate tire casings of various sizes. 4 figures. E.G.S.

KOHL, WILLIAM R., and IVERSON, ARDEN L. Shirt collar support. U. S. patent 2,519,380. Filed Aug. 13, 1947. Issued Aug. 22,

1950. 6 claims. Assigned to Para-Lux Products Company. [Cl. 223-83]

A one-piece, flexible paperboard collar support is adapted to protect a new or freshly laundered shirt against crushing or wrinkling. 7 figures. E.G.S.

RINGLER, WILLIAM A. Carrier. U. S. patent 2,518,818. Filed June 11, 1945. Issued Aug. 15, 1950. 7 claims. Assigned to The Gardner Board and Carton Co. [Cl. 229-52]

A collapsible or knockdown paperboard carrier is adapted for use as a fruit basket; perforations in the walls provide ventilation for the fruit. 16 figures. E.G.S.

ROESSLER, ALBERT B., JR. Lethal animal trap. U. S. patent 2,518,819. Filed Jan. 27, 1948. Issued Aug. 15, 1950. 3 claims. [Cl. 43-61]

A sealed gelatin capsule which contains chloroform or ether is cemented to the inner flap surface of a paperboard rodent trap. When a trapped rodent attempts to escape from the trap by gnawing at the flap, he will pierce the capsule and release the lethal fumes. 4 figures. E.G.S.

SCHWINGER, CHARLES I. File folder. U. S. patent 2,519,405. Filed Oct. 30, 1945. Issued Aug. 22, 1950. 3 claims. [Cl. 229-72]

A fiberboard file folder is provided with expansible pockets and an expansible front wall member which is retained in alignment with the body of the folder whether the pockets are full or empty. 6 figures. E.G.S.

WINTON, FRANKLIN W. Display and dispensing device. U. S. patent 2,519,949. Filed Feb. 4, 1950. Issued Aug. 22, 1950. 4 claims. Assigned to The Warner Brothers Company. [Cl. 206-44.12]

An upright, magazine-type, open container is designed for use in a counter display. The device is self-supporting when set up and is relatively stable, even though it has a small base area; it may be folded into a compact package for storage or shipment. 4 figures. E.G.S.

BOARD TESTING—PHYSICAL

MCCORMICK, JOHN M. Testing of materials by impact. U. S. patent 2,518,350. Filed Dec. 8, 1948. Issued Aug. 8, 1950. 6 claims. Assigned to Frank W. Preston. [Cl. 73-12]

An impact tester for paperboard and other materials consists of three pendulumlike members, which are suspended at their upper ends on a common shaft, and a permanent magnet and a solenoid, which are mounted on two of the pendulums in such a manner that one telescopes within the other. In making an impact test on a specimen, the first pendulum is drawn back in an arc to a predetermined distance from its vertical rest position and then released, so that a platen or impact member on the first pendulum will strike the test piece, which is mounted on the second pendulum. The reaction of the impact causes the magnet on the third pendulum to enter the solenoid coil on the second pendulum, thus inducing a current in the coil, which is used to energize an oscilloscope. The duration of current flow depends upon the time required for the tubular core of the solenoid to strike the base plate upon which the magnet is mounted, and upon the velocity of the pendulum bob members carried by the second pendulum. The maximum acceleration of

the second pendulum may be displayed as a visible pattern by connecting the solenoid coil through a differentiating circuit to the oscilloscope. The force acting is equal to the product of the mass and the acceleration of the pendulum; since the mass of the pendulum is constant, its maximum acceleration is a measure of the peak force. 11 figures. E.G.S.

BOOKBINDING

D'HUY, FRANCISCUS P. Bookbinding case, the covers of which consist of cardboard, which is doubled by folding it along the edges. U. S. patent 2,517,640. Filed Oct. 23, 1946. Issued Aug. 8, 1950. 3 claims. [Cl. 281-29]

This is similar to Canadian patent 464,744; *cf.* B.I.P.C. 20: 755. E.G.S.

CELLOPHANE

MULFORD, MARION R. Bulb display package. U. S. patent 2,518,711. Filed June 27, 1946. Issued Aug. 15, 1950. 2 claims. Assigned to Hewett P. Mulford & Company. [Cl. 206-45.33; changed to 206-45.31]

A display package for plant bulbs consists of a cellophane envelope, into which a cardboard stiffening member is inserted. A cutout portion of the cardboard member serves as an inspection window. 6 figures. E.G.S.

CELLULOSE ETHERS

BRANAN, WILEY M., and HOLMES, HARRISON H. Process for production of low viscosity carboxyalkyl cellulose. U. S. patent 2,517,835. Filed Nov. 21, 1947. Issued Aug. 8, 1950. 8 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-231]

A process for the production of low-viscosity, water-soluble sodium carboxymethylcellulose comprises the addition to the reaction mixture, after a treatment of cellulose with sodium hydroxide and an etherifying agent (e.g., monochloroacetic acid or sodium monochloroacetate), of a compound of a metal (e.g., manganous sulfate, nickelous oxalate, cobaltous nitrate, or ammonium metavanadate) in the ratio of one part of elemental metal to 1000-30,000 parts of cellulose by weight. E.G.S.

DISPENSING CONTAINERS

MILLER, JAMES S. Ice cream dispensing package. U. S. patent 2,519,271. Filed Sept. 18, 1947. Issued Aug. 15, 1950. 4 claims. [Cl. 222-386; changed to 206-47]

A dispensing container for ice cream consists of an open-end cylinder of single-ply, waterproof paper and a second cylinder of multi-ply, waterproof paper, which is arranged to telescope into and closely fit the walls of the first cylinder. The paper is treated with paraffin to render it impervious to liquids. 5 figures. E.G.S.

RINGLER, WILLIAM A. Display and dispensing carton. U. S. patent 2,517,030. Filed June 15, 1945. Issued Aug. 1, 1950. 3 claims. Assigned to The Gardner Board and Carton Co. [Cl. 211-73; changed to 211-128]

The front wall of a combination shipping and display carton is constructed

in such a manner that several tiers of shelflike supports for rows of articles are presented when the carton is arranged in the display position. 5 figures. E.G.S.

FOLDING BOXES

FIELD, JACOB M. Container. U. S. patent 2,517,552. Filed July 25, 1946. Issued Aug. 8, 1950. 4 claims. Assigned to Deering, Milliken & Co., Inc. [Cl. 229-39]

A hexagonal pasteboard carton is designed for the packaging and shipment of rolled materials and cylindrical objects; the structure may be shipped flat and erected by the packager. 5 figures. E.G.S.

FRANKENSTEIN, WILLIAM P. Carton. U. S. patent 2,519,831. Filed Feb. 15, 1945. Issued Aug. 22, 1950. 15 claims. [Cl. 229-34]

The outer walls of a folding carton are arranged to form the frustum of a cone, and the inner walls are normal to the base of the carton. 16 figures. E.G.S.

GRIFFIN, PEARL M. Package carrier. U. S. patent 2,518,681. Filed Jan. 2, 1948. Issued Aug. 15, 1950. 7 claims. [Cl. 229-52]

A carton is provided with a flexible cord handle which is designed to encircle a major portion of the package at two spaced points and which may be disengaged from the package-encircling position when the pulling strain on the handles is removed. 4 figures. E.G.S.

RYAN, FRANKLIN A. Shoelace package. U. S. patent 2,519,706. Filed Dec. 13, 1946. Issued Aug. 22, 1950. 1 claim. Assigned 20% to Clinton T. Snyder. [Cl. 206-46]

A shoelace package is formed from an integral cardboard sheet; a shoelace is wound onto each of two flaps which are folded upon one another and enclosed by two additional folded flaps; the outer flaps are locked in place by a tongue-and-slot arrangement. 3 figures. E.G.S.

ZABRISKIE, GEORGE A., III, and ZABRISKIE, FOSDICK. Method of making ice cream layer cake. U. S. patent 2,517,756. Filed Jan. 25, 1950. Issued Aug. 8, 1950. 7 claims. Assigned to Airlines Foods Corp. [Cl. 99-180; changed to 99-137]

A paper container for an ice cream layer cake incorporates a single-faced corrugated liner. The corrugations of the liner serve as spacing grooves for layers of biscuit, which are alternated with layers of ice cream. 5 figures. E.G.S.

INTERIOR PACKING

SCHUH, CHARLES H. Cushion pad and method of manufacture. U. S. patent 2,517,724. Filed May 29, 1945. Issued Aug. 8, 1950. 18 claims. Assigned to Union Carbide and Carbon Corporation. [Cl. 18-47.5]

A method of producing a resilient cushion pad comprises the steps of forming a slurry whose disperse phase contains about 65 parts by weight of water-resistant palmetto pith, about 31 parts of finely pulped newsprint paper or wood pulp (in which the fibers are individualized and have an average length of not more than 0.08 inch), and about four parts of paraffin wax, and whose continuous phase consists of about 1200 parts of water; run-

ning the slurry into a mold and draining the water from the slurry to form a matrix; drying the matrix and then crushing it to the approximate size of the core of the finished pad, thus loosening the bonds between the constituent materials; applying a water dispersion of reclaimed rubber to the surface of the crushed matrix and integrating the rubber with the matrix material at their adjacent surfaces; heating the covered matrix, thus causing it to puff; and partially crushing the puffed structure to the size of the finished pad. 2 figures. E.G.S.

MACHINERY—CONVERTING MACHINERY

CHAPMAN, FRED H. Machine for folding box blanks and the like. U. S. patent 2,519,111. Filed Oct. 8, 1945. Issued Aug. 15, 1950. 17 claims. Assigned to The International Paper Box Machine Company. [Cl. 93-49]

A tab-folding mechanism is provided in which the forward motion of the tab folder is arrested after its folding operation to permit the tab of the traveling box blank to pass from beneath the folder. 8 figures. E.G.S.

COX, HERBERT F., JR. Scoring roller. U. S. patent 2,519,355. Filed April 1, 1946. Issued Aug. 22, 1950. 4 claims. Assigned to American Can Company. [Cl. 93-58.1]

A roller for scoring fibrous or metallic sheet material is provided with additional or spare pockets, channels, or grooves into which the scoring knives can be inserted after their removal from worn-out pockets, channels, or grooves. This construction permits the knives to be changed without the removal of the roller from its installation. 2 figures. E.G.S.

INMAN, WILLIAM H. Carton folding machine. U. S. patent 2,518,014. Filed Aug. 9, 1946. Issued Aug. 8, 1950. 16 claims. Assigned to Bloomer Bros. Company. [Cl. 93-49]

This is the same as Canadian patent 462,482; *cf.* B.I.P.C. 20: 448. E.G.S.

SHIELDS, ALBERT F. Carton blank folding machine. U. S. patent 2,517,449. Filed June 3, 1947. Issued Aug. 1, 1950. 3 claims. Assigned to S. & S. Corrugated Paper Machinery Co., Inc. [Cl. 93-49]

A carton blank folding machine is designed for the rapid folding and delivery of blanks at a rate of 120-180 units or more per minute. Means are included for straightening and re-forming the crease in any blank in which the folded panels are askew, without causing a reduction in the rate of folding. 15 figures. E.G.S.

MACHINERY—DRYERS

BLUE, ARTHUR A. Drier roll for paper, paperboard, and like material. U. S. patent 2,519,105. Filed Aug. 14, 1947. Issued Aug. 15, 1950. 8 claims. [Cl. 34-110]

A drier roll incorporates a cylindrical barrel which is constructed of a chromium-copper alloy having a thermal conductivity of 0.74-0.84 g.-cal./(sec.)(sq.cm.)(°C./cm.). The barrel heads are constructed of an austenitic alloy steel which has a minimum tensile strength of 45,000 p.s.i. at temperatures up to 350° F.; the steel has a thermal conductivity of 0.023-0.040 c.g.s. units. It is claimed that the use of the copper-base alloy in the barrel affords a relatively high rate of heat transfer from the drier to the paper and hence permits increased machine speeds. 1 figure. E.G.S.

WELLMAR, SVEN. Apparatus for drying material in the form of webs. U. S. patent 2,518,104. Filed Sept. 27, 1946. Issued Aug. 8, 1950. 9 claims. Assigned to A. B. Svenska Fläktfabriken. [Cl. 34-159]

This is similar to Canadian patent 465,097; *cf.* B.I.P.C. 20: 760.

E.G.S.

MACHINERY—FELTS

ALBRIGHT, CHARLES B. Method and apparatus for drying and curing felts. U. S. patent 2,518,740. Filed Feb. 3, 1947. Issued Aug. 15, 1950. 10 claims. Assigned to The Orr Felt & Blanket Company. [Cl. 34-24]

A method and apparatus are described for the drying and curing of a resin in a papermakers' felt in a continuous process. The body of the felt is maintained at an elevated temperature during the drying and curing operation; air is driven through the felt during part of the operation in order to effect a uniform drying of the felt and curing of the resin throughout the body of the felt. 8 figures. E.G.S.

MACHINERY—PACKAGING MACHINERY

ZENKE, HERBERT J., and ARNOLD, EDGAR E. Bag filling and weighing apparatus. U. S. patent 2,517,954. Filed March 1, 1945. Issued Aug. 8, 1950. 9 claims. Assigned to St. Regis Paper Company. [Cl. 226-47; changed to 226-48]

An apparatus is provided for the loading, packing, and weighing of pulverized, granular, and other loose or rubblelike material in valve bags; means are included for constantly jigging the bag and its contents during the filling operation. 5 figures. E.G.S.

MACHINERY—PASTING MACHINE

BERGSTEIN, SAMUEL. Method and apparatus for sealing containers. U. S. patent 2,519,102. Filed Nov. 22, 1946. Issued Aug. 15, 1950. 17 claims. Assigned to Robert M. Bergstein and Frank D. Bergstein. [Cl. 93-6]

A method and apparatus are adapted for the injection sealing of tubular liners after they have been placed in paperboard cartons and filled. 23 figures. E.G.S.

MACHINERY—SAND TRAPS

SMITH, CHARLES W. Apparatus for separating relatively heavy particles from liquid. U. S. patent 2,518,084. Filed July 23, 1945. Issued Aug. 8, 1950. 7 claims. [Cl. 92-28]

A separator is adapted for the discharge or separation of sand and other heavy or foreign particles from a pulp stock, even though there is a considerable variation in the consistency of the stock. It is claimed that the flow of stock through the unit tends to prevent clogging. 3 figures. E.G.S.

MACHINERY—SAVE-ALLS

PENTÉN, LARS E. Method and means for the separation of fibers suspended in a liquid. U. S. patent 2,518,814. Filed Jan. 30, 1945.

Issued Aug. 15, 1950. 9 claims. Assigned to Leje & Thurne Aktiebolag. [Cl. 210-53]

This corresponds to Canadian patent 443,542; *cf.* B.I.P.C. 18: 70. E.G.S.

MACHINERY—SCREENS

BLIKSTAD, FINN, and PEDERSEN, ERLING. Apparatus for purifying fibrous suspensions. U. S. patent 2,517,832. Filed Jan. 10, 1946. Issued Aug. 8, 1950. 2 claims. [Cl. 92-28]

This is included as a portion of Canadian patent 455,431; *cf.* B.I.P.C. 19: 672. E.G.S.

MACHINERY—TUBE MAKING MACHINE

SCHERER, WAYNE R. Apparatus for winding tubes. U. S. patent 2,518,075. Filed March 1, 1946. Issued Aug. 8, 1950. 5 claims. Assigned to Taylor Fibre Co. [Cl. 93-81]

A method and apparatus are described for winding tubes of paper or other material impregnated with a synthetic substance (e.g., a phenol-formaldehyde resin). The tension of the material which passes to a driven winding mandrel acts to retain the tube in winding contact with a pair of heated rolls, so that the tightness of the winding of the tube is controlled entirely by the tension of the strip which passes to the mandrel. 4 figures. E.G.S.

MOLDED PULP ARTICLES

COX, JOHN W. Molded pulp carton. U. S. patent 2,517,465. Filed Dec. 20, 1947. Issued Aug. 1, 1950. 4 claims. Assigned to Shellmar Products Corporation. [Cl. 229-2.5]

A molded pulp egg carton incorporates a hinged lid and includes a locking tab which is attached to the body of the carton and which is designed to engage and lock the cover in a closed position. 9 figures. E.G.S.

RISCH, ARTHUR H. Pulp decoy. U. S. patent 2,518,721. Filed May 10, 1947. Issued Aug. 15, 1950. 2 claims. Assigned to Pulp Reproduction Company. [Cl. 43-3]

A hunter's duck decoy is constructed of molded paper pulp; the number of projecting parts of the decoy body is minimized to avoid breakage. 2 figures. E.G.S.

PAPER—COATED

CUPERY, MARTIN E. Aqueous dispersion of ethylene polymers containing a salt of a polymeric amic acid. U. S. patent 2,496,989. Filed May 24, 1946. Issued Feb. 7, 1950. 17 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-29.6]

A paper coating composition consists of an aqueous dispersion of polymerized ethylene and the ammonium salt of polymeric octadecylbutylstyrene-maleamic acid. The coated paper product has a relatively low power factor and a high breakdown voltage. E.G.S.

PAPER—COATED (HOT-MELT)

YOUNG, ARTHUR E., and BACON, KENNETH D. Hot-melt coating composition. U. S. patent 2,517,754. Filed Nov. 13, 1945. Issued

Aug. 8, 1950. 2 claims. Assigned to The Dow Chemical Company. [Cl. 106-186]

A wax-free, hot-melt coating composition can be applied to the end labels of bread wrappers and will adhere to and form a seal with any of the usual bread-wrapping sheets (i.e., waxed paper, untreated paper, or regenerated cellulose). The composition consists essentially of an ethylcellulose which has an ethoxyl content of 47.5-50% and a viscosity of less than 30 centipoises (measured in 5% solution with a mixture of 80 parts of toluene and 20 parts of ethanol); a pale, refined mineral oil which has a viscosity of 40-100 Saybolt seconds at 210° F., and an ethylenediamine polyamide (molecular weight 3000-5000) of a partially polymerized acid, selected from the group consisting of linoleic and linolenic acids. The proportions of the three ingredients are indicated on an accompanying ternary diagram. 1 figure. E.G.S.

PAPER—COATED (WRINKLE COATING)

BEYNON, NATHAN T. Wrinkle coating composition consisting of a mixture of conjugated double-bonded oil and an aqueous emulsion of polyvinyl acetate resin. U. S. patent 2,479,298. Filed June 9, 1945. Issued Aug. 16, 1949. 2 claims. Assigned to New Wrinkle, Inc. [Cl. 260-23]

A wrinkle-coating composition consists of an uncooked homogeneous mixture of 100 parts by weight of a conjugated, double-bonded oil (e.g., tung or oiticica oil) and 10-50 parts by weight of polyvinyl acetate resin in the form of an aqueous emulsion. E.G.S.

BEYNON, NATHAN T. Wrinkle flexible material with rubber latex coating and method of producing same. U. S. patent 2,508,092. Filed May 28, 1948. Issued May 16, 1950. 9 claims. Assigned to New Wrinkle, Inc. [Cl. 117-41]

A method for the manufacture of flexible, wrinkle-coated materials comprises the steps of mixing at room temperature 100 parts by weight of an unsaturated fatty oil with a varnish solvent and 10-50 parts by weight of an aqueous dispersion of polyvinyl chloride latex; applying the resultant mixture to a base material (e.g., paper, fabrics, leather, cork, and the like); and drying the coated material at about 130° F. for approximately 30 minutes and then at 180° for 30-60 minutes. E.G.S.

FLANAGAN, WILLIAM F. Apparatus for producing wrinkle texture on nonwrinkling films. U. S. patent 2,510,967. Filed March 30, 1948. Issued June 13, 1950. 1 claim. [Cl. 18-15]

An apparatus for producing wrinkle-textured films comprises a driven belt; a container of resin solution, together with means for applying the solution to the belt; means for developing a skin on the resin, spraying the skin with water, and evaporating the solvent from the resin solution; a trisodium phosphate bath for loosening the film on the belt; and means for peeling the film from the belt. 5 figures. E.G.S.

FLANAGAN, WILLIAM F. Method of giving nonwrinkling materials a wrinkle texture. U. S. patent 2,510,966. Filed Nov. 12, 1946. Issued June 13, 1950. 8 claims. Assigned to New Wrinkle, Inc. [Cl. 18-57]

The surface of a sheet material (e.g., paper, glass, metal, fabric, and the like) is covered with a layer of metal dust, and a transparent, wrinkle-

textured film is superimposed on the dusted sheet. The film is formed of a thermoplastic, resinous coating composition which has inherent nonwrinkling properties. 5 figures. E.G.S.

LUÁCES, ENRIQUE L. Dextran base wrinkle drying compositions. U. S. patent 2,503,622. Filed May 20, 1949. Issued April 11, 1950. 4 claims. Assigned to New Wrinkle, Inc. [Cl. 106-215]

A wrinkle-drying coating composition consists of 100 parts by weight of a wrinkling oil (e.g., tung oil, oiticica oil, dehydrated castor oil, blown linseed oil, or alkali-isomerized oils prepared from peanut or cottonseed oil) and 10-50 parts of a dextran ether selected from the group consisting of dextran butyl ether, dextran β-hydroxy ethyl ether, and dextran ethyl ether; the ingredients are mixed at room temperature. E.G.S.

LUÁCES, ENRIQUE L. Dextran base wrinkle drying compositions. U. S. patent 2,503,623. Filed May 20, 1949. Issued April 11, 1950. 4 claims. Assigned to New Wrinkle, Inc. [Cl. 106-215]

A wrinkle-drying coating composition consists of 100 parts by weight of a wrinkling oil and 10-50 parts by weight of a mixture of dextran benzyl ether and dextran butyl ether. E.G.S.

LUÁCES, ENRIQUE L. Dextran base wrinkle drying compositions. U. S. patent 2,503,624. Filed May 20, 1949. Issued April 11, 1950. 2 claims. Assigned to New Wrinkle, Inc. [Cl. 106-215]

A wrinkle-coating composition comprises a mixture of 100 parts by weight of a wrinkling oil and 10-50 parts by weight of dextran acetate; the ingredients are admixed at room temperature. E.G.S.

LUÁCES, ENRIQUE L. Wrinkle drying composition containing dextran benzyl ether. U. S. patent 2,490,070. Filed Feb. 8, 1946. Issued Dec. 6, 1949. 4 claims. Assigned to New Wrinkle, Inc. [Cl. 106-215]

A wrinkle-coating composition consists essentially of 100 parts by weight of a wrinkling oil (i.e., an oil which includes conjugated double bonds in its chemical structure), a thinner, and 40 parts of dextran benzyl ether, all mixed at room temperature. The product is suitable for the coating of paper or fabrics. E.G.S.

TOULMIN, HARRY A., JR. Method for producing ornamental wrinkle films. U. S. patent 2,511,024. Filed April 7, 1947. Issued June 13, 1950. 33 claims. Assigned to New Wrinkle, Inc. [Cl. 18-57]

A method of making a plastic film which has a predetermined pattern and a wrinkle-textured surface comprises the steps of applying a pattern to a support (e.g., copper, stainless steel, paper, glass, or wood); casting a film onto the support from a heated solution which consists of 25 parts by weight of vinyl acetate-vinyl chloride copolymer (ratio 5: 95), 50 parts of butyl acetate, 102.5 parts of 2-butanone, 62.5 parts of cyclohexanone, and 10 parts of dioctyl phthalate; heating the surface of the film with infrared light until a skin has just developed; applying water to the film; and removing the solvent and water from the film. 18 figures. E.G.S.

WALDIE, WILLIAM A. Vinyl air-drying wrinkle composition and method of applying same. U. S. patent 2,494,597. Filed Feb. 28,

1947. Issued Jan. 17, 1950. 5 claims. Assigned to New Wrinkle, Inc. [Cl. 117-41]

A method of coating articles with a wrinkle-textured film includes the steps of preparing a mixture of four pounds of polyvinyl butyral, four gallons of butanol, and one gallon of water; allowing air to escape from the mixture; applying the mixture to the surface which is to be coated, and drying the coating with infrared heat for from one to five minutes. E.G.S.

WALDIE, WILLIAM A. Wrinkle finish. U. S. patent 2,486,232. Filed April 19, 1947. Issued Oct. 25, 1949. 26 claims. Assigned to New Wrinkle, Inc. [Cl. 260-23]

A wrinkle-coating composition is described which does not require the addition of a plasticizer. The product is prepared by heating 26.25 pounds of raw tung oil, 5.75 pounds of glycerin, and 0.25 pound of litharge to 440-450° F. for 30 minutes; raising the temperature to 500°; adding 0.125 pound of cobalt acetate; and adding to one volume of the above mixture approximately three volumes of a resin solution which contains two pounds of polyvinyl butyral resin, 1.5 gallons of butanol, and 1.5 gallons of butyl acetate. E.G.S.

PAPER SIZING

KYAME, GEORGE J. Method of and apparatus for preparation and distribution of sizing materials. U. S. patent 2,516,884. Filed Dec. 8, 1948. Issued Aug. 1, 1950. 3 claims. Assigned to the United States of America as represented by the Secretary of Agriculture. [Cl. 127-28]

A size preparation unit comprises a make-up tank, a pump, and a heat exchanger which are connected in such a manner that the pump draws fluid from the bottom of the tank and forces it through the heat exchanger. The discharge from the heat exchanger is fed back into the tank at a position and in a direction designed to produce a vigorous agitation of the contents. For the storage and distribution of the finished size, the combination of a storage tank, pump, heat exchanger, and size box is used; in this instance, the size is withdrawn simultaneously from the storage tank and size box and is pumped through the heat exchanger. The heat-exchanger discharge is divided into two streams, one returning to the storage tank and the other to the size box; both streams are utilized to agitate the contents of the respective tanks. A float-type valve which controls the rate of fluid withdrawal is used to maintain a constant fluid level in the size box. 6 figures. E.G.S.

PAPER SPECIALTIES

COCHRAN, CHARLES B. Combination advertising and return order blank. U. S. patent 2,517,843. Filed April 21, 1947. Issued Aug. 8, 1950. 1 claim. [Cl. 229-92.1]

A combination sending-and-returning letter form is designed to be sent through the mail without the use of fasteners such as stickers or clips, although it contains several pages of paper. 8 figures. E.G.S.

DRAHEIM, ERNEST C. Cured meat wrapper. U. S. patent 2,518,762. Filed Dec. 19, 1946. Issued Aug. 15, 1950. 3 claims. Assigned to Daniels Manufacturing Company. [Cl. 154-50]

A multi-ply wrapper for cured meats consists of an outer protecting sheet of vegetable parchment or lightweight kraft, a creped, absorbent cushion layer formed of unsized, water-formed sulfite or groundwood paper, and an

interior barrier sheet composed of a grease- and moisture-resistant stock such as glassine or regenerated cellulose. The layers are bonded together with an amorphous wax adhesive; the wax is applied at intervals over the adjacent surfaces of the sheets, so that ventilation spaces are provided between the sheets. 3 figures. E.G.S.

GORTON, THOMAS S., JR. Frozen food package. U. S. patent 2,519,960. Filed Oct. 11, 1948. Issued Aug. 22, 1950. 1 claim. [Cl. 62-1]

A frozen food package includes a three-sided, resilient plastic box structure whose flexible sides are held apart by a fourth side made of ice. With a transparent paper wrapping sheet serving as the bottom, the box structure is filled with freezable food, and the sheet is folded or wrapped around the sides and over the top of the package, where it is secured by cementing or stapling. The sealed package is then quick-frozen in the usual manner. The ice side member serves to show the prospective purchaser whether or not the food has remained frozen since its initial quick freezing; if thawing has taken place, the package will have been deformed by the melting of the ice sheet. 5 figures. E.G.S.

GOTTESMAN, HERMAN. Freezing and cooking bag. U. S. patent 2,516,978. Filed Sept. 27, 1946. Issued Aug. 1, 1950. 1 claim. [Cl. 229-55]

A bag for the deep freezing of vegetables and other foods can be used subsequently for heating or cooking the contents without disturbing or rehandling the products. The bag includes an inner porous layer of vegetable parchment and an outer airtight layer of aluminum or other metal foil which is resistant to the transmission of water vapor. The mouth of the bag is sealed by means of a sealing strip which is doubled and fused in place over the open end of the bag. 6 figures. E.G.S.

JAHODA, EDWARD. Light-sensitive blueprint layer and process of producing the same. U. S. patent 2,517,111. Filed Nov. 14, 1946. Issued Aug. 1, 1950. 3 claims. [Cl. 95-7]

A relatively high-viscosity sensitizing solution for the coating of blueprint paper exhibits a relatively reduced rate of penetration into the base paper. The solution contains approximately five parts of neutral hydrolyzable potassium sodium hexametaphosphate, four parts of potassium ferricyanide, and four parts of ferrous ammonium oxalate. E.G.S.

MCCARTHY, JAMES F. Preservative compositions for cellulosic materials. U. S. patent 2,518,241. Filed May 29, 1945. Issued Aug. 8, 1950. 1 claim. Assigned to Treesdale Laboratories, Inc. [Cl. 260-28; changed to 260-19]

A colorless, flame- and waterproofing composition for woven or matted fibers (i.e., textiles or paper) consists of the following: 4.5% phenol-formaldehyde resin; 26.9% chlorinated paraffin (42%); 16.0% chlorinated paraffin (70%); 24.0% calcium carbonate (finely divided); 19.71% antimony oxide; 1.2% aluminum stearate; and 7.69% solvent (e.g., toluene, naphtha, or 2-butanone.) E.G.S.

ROUSH, JOHN H. Packaging structure. U. S. patent 2,517,801. Filed Sept. 6, 1946. Issued Aug. 8, 1950. 1 claim. [Cl. 229-51]

A packaging structure incorporates an adhesively coated tearing strip

which has a tab or gripping tongue at one end; a rip cord extends the entire length of the strip, including the tongue. The tongue will tear toward the rip cord to provide a grasping surface during the package-opening operation. 6 figures. E.G.S.

PHYSICAL TESTING—PAPER—BURSTING STRENGTH

TINKER, MALCOLM H. Apparatus for testing the crush strength of paper. U. S. patent 2,518,959. Filed July 21, 1948. Issued Aug. 15, 1950. 2 claims. Assigned to B. F. Perkins & Son, Inc. [Cl. 73-94]

This crush tester is similar to the instrument which was described in U. S. patent 1,758,688, issued May 13, 1930. The apparatus includes a hydraulic cylinder which is actuated by a handwheel, so that a flexible rubber diaphragm is distended by the liquid in the cylinder. The diaphragm, in turn, acts upon a pressure plate which is in contact with the edge of the test specimen. The crush strength is read from a pressure gage which communicates with the hydraulic fluid. The tester is designed to accommodate specimens of various thicknesses. 2 figures. E.G.S.

PLASTICS—PAPER-BASE

FORD, HENRY, and BOYER, ROBERT A. Method of molding cellular articles. U. S. patent 2,519,036. Filed Aug. 11, 1943. Issued Aug. 15, 1950. 5 claims. Assigned to Ford Motor Company. [Cl. 154-118]

A process for the production of a uniformly pressed cellular sheet material comprises the steps of quilting a comminuted, nonpackable, flowable material (e.g., sand, fine metal shot, diatomaceous earth, salts, and the like) between sheets of resin-impermeable, flexible cellulosic material (e.g., cellophane, sized paper, and the like); applying a sealing compound to the needle perforations; placing long sections of a resin-impregnated paper or fabric sheeting in contact with the quilted sheet; positioning the quilted sections and resin-impregnated, flexible cellulosic materials between additional sheets of resin-impregnated materials; and molding under heat and pressure. 12 figures. E.G.S.

PULP WASHING

LIPSCOMB, GASTON J. Apparatus for diluting and washing pulp solutions and like materials. U. S. patent 2,506,882. Filed Sept. 19, 1945. Issued May 9, 1950. 5 claims. Assigned to W. R. Grace & Co. [Cl. 68-23]

A centrifugal-type apparatus is adapted for the diluting and washing of paper pulp and similar materials. The pulp suspension and dilution water are delivered continuously to the interior of a rotatable, perforate, inverted cone member, through which the liquid passes, while the pulp particles rise to the surface of the liquid and move upwardly along the upper portion of the cone surface which is exposed above the liquid in the cone; wash water is applied to the pulp as it passes over the exposed, upper area of the cone, before it is discharged continuously from the upper edge of the cone. 3 figures. E.G.S.

PURIFIED WOOD FIBER

GRAY, KENNETH R. Wood pulp. U. S. patent 2,518,680. Filed June 22, 1945. Issued Aug. 15, 1950. 5 claims. Assigned to Rayonier Incorporated. [Cl. 260-212]

A method is described for the production of an improved wood pulp from a refined wood pulp which contains not more than 0.15% (based on bonedry pulp) of natural, ether-extractable matter consisting of saponifiable matter and not more than 0.07% of oil-soluble, unsaponifiable matter. The quantities of saponifiable and unsaponifiable matter are determined and adjusted to a predetermined norm (not over 0.15%) by the addition to the pulp of one of the forms of ether-extractable matter. The saponifiable addition is a compound of the group which consists of free fatty and resin acids and the glycerides or esters of higher alcohols; the unsaponifiable addition is an oil-soluble alcohol such as cholesterol or phytosterol. The process permits the preparation of a uniform pulp from different types of woods. E.G.S.

SHIPPING CONTAINERS

BUHRMASTER, FREDERICK R. Carton. U. S. patent 2,517,080. Filed March 25, 1948. Issued Aug. 1, 1950. 3 claims. Assigned to Gaylord Container Corporation. [Cl. 229-23]

A stapled fiberboard container includes multi-ply reinforcing flaps along the upper edges of its end panels; the flaps are folded to provide a smooth, thick exterior finger grip for lifting the carton. 6 figures. E.G.S.

CODY, RICHARD J. Shipping and display box. U. S. patent 2,517,767. Filed Jan. 28, 1948. Issued Aug. 8, 1950. 1 claim. Assigned to Federal-Mogul Corporation. [Cl. 229-42]

A cardboard carton is adapted for the packaging of crankshaft bearings; a Z-shaped partition serves to subdivide the box into separate compartments for each bearing shell. 6 figures. E.G.S.

FARRELL, JAMES A. Shipping container for irregular shaped articles. U. S. patent 2,517,186. Filed July 9, 1948. Issued Aug. 1, 1950. 5 claims. Assigned to Cadillac Products, Inc. [Cl. 206-46]

A shipping container for irregular or curved articles (e.g., automobile bumper sections, trim molding, and the like) is formed of two or more cylindrical fiberboard tubes which are arranged in side-by-side relationship and which are apertured to form a communicating passage between the tubes, through which a part of the article in one tube extends into the other tube. 5 figures. E.G.S.

HUNSWORTH, MELVIN T. Container. U. S. reissue patent 23,257. Filed May 2, 1950. Issued Aug. 22, 1950. 14 claims. Assigned to Container Corporation of America. [Cl. 229-23]

An opening rip cord is anchored to a rigid, nonweaving paperboard container in such a manner that only a single thickness of the container material is severed in opening the container. This is a reissue of U. S. patent 2,488,194; *cf.* B.I.P.C. 20: 293. 6 figures. E.G.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

WEEKS, NORMAN E. Folded-in bag valve with sleeve insert. U. S. patent 2,517,068. Filed Sept. 8, 1947. Issued Aug. 1, 1950. 2 claims. Assigned to Bemis Bro. Bag Company. [Cl. 150-9]

A valved bag incorporates a folded-in valve and a creped kraft paper valve sleeve which may be tucked in to form a tight closure after the bag is filled. 9 figures. E.G.S.

TALL OIL

BERETVÁS, HELEN S. Protective coatings. U. S. patent 2,518,438. Filed Nov. 5, 1945. Issued Aug. 15, 1950. 11 claims. Assigned to Nox-Rust Corporation. [Cl. 106-267; changed to 106-243]

A liquid, corrosion-inhibiting composition for providing a resinlike protective coating comprises a calcium naphthenate and a zinc naphthenate which together total at least 2% of the composition, a lead tall oil soap, and a carrying vehicle in which the soaps are soluble. E.G.S.

GAYER, FREDERICK H. Recovery of dehydroabietic acid. U. S. patent 2,503,238. Filed July 15, 1948. Issued April 11, 1950. 10 claims. Assigned to Continental Research Corporation. [Cl. 260-100]

A method for the recovery of dehydroabietic acid from a resin acid material (e.g., a tall oil resin acid fraction) in which abietic acid has been largely converted to dehydroabietic acid includes the steps of preparing an aqueous dispersion of the resin acid material at a free resin acid ratio of 40-100% in 10-200 parts by weight of water, and crystallizing dehydroabietic acid from the dispersion at 70-80° C. E.G.S.

HASSELSTROM, TORSTEN. Removal of the sodium salt of lignoceric acid and other materials from a tall oil soap. U. S. patent 2,519,903. Filed July 17, 1947. Issued Aug. 22, 1950. 8 claims. Assigned to U. S. Industrial Chemicals, Inc. [Cl. 260-97.7]

A method for the refining of an aqueous tall oil soap solution which contains at least 40% by weight of solids comprises the steps of admixing the solution with a treating agent which consists essentially of water until it contains 0.5-25% by weight of solids, and subsequently permitting the mixture to settle for a period of time sufficient to effect a separation of the color bodies and sodium lignocerate. E.G.S.

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